

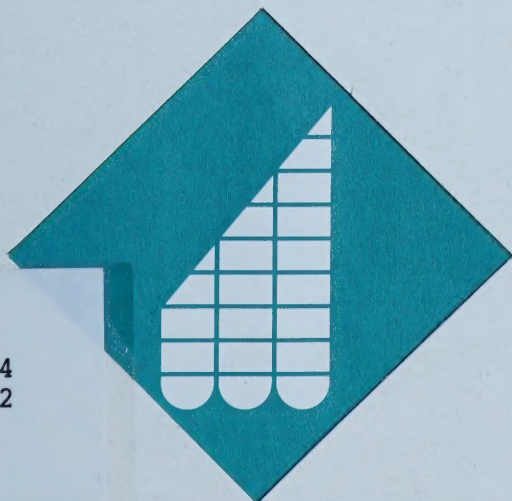
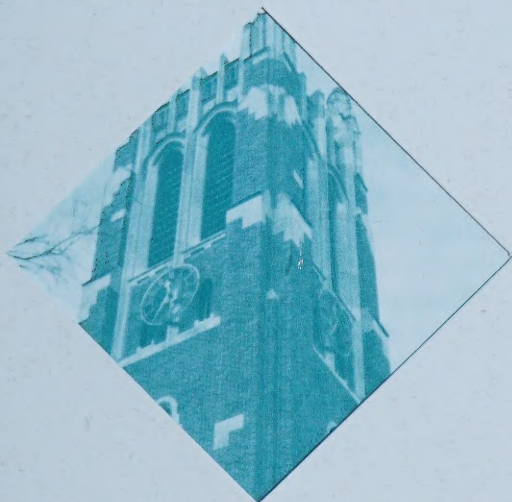
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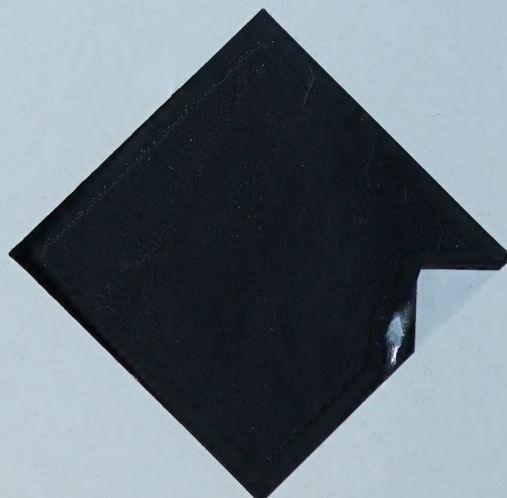
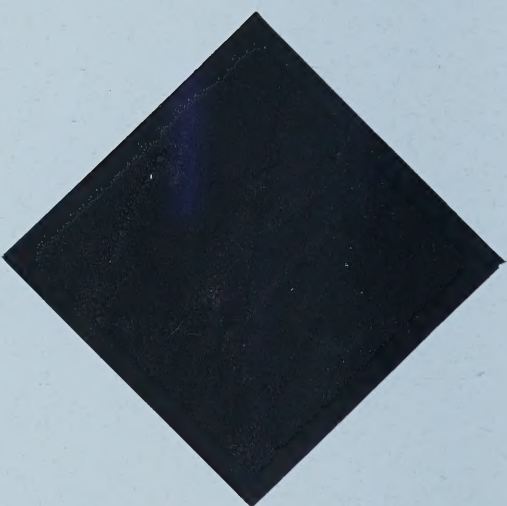
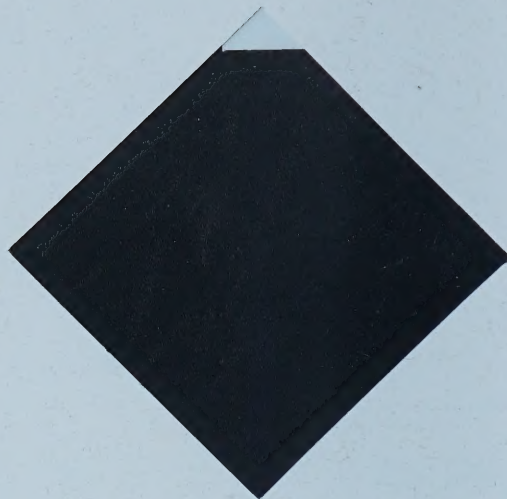
# Annual Report



Michigan State University  
Agricultural Experiment Station

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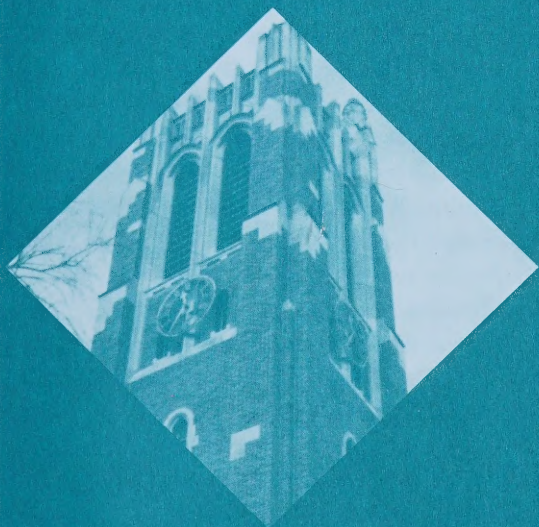
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# 1992

# Annual Report



## Michigan State University Agricultural Experiment Station

109 Agriculture Hall  
Michigan State University  
East Lansing, MI 48824-1039  
(517)355-0123

*Report prepared under the direction of Robert G. Gast, director of the Michigan Agricultural Experiment Station, and Doreen Woodward, assistant director finance & operations.  
Design by Christine Altese; editing and production by Jamie DePolo, information officer,  
Outreach Communications.*

# 1992:

## *Working to Prepare Michigan Agriculture and Natural Resources for the 21st Century*

**A**griculture, Michigan's second largest industry, has gone through a major period of growth and productivity during the past several decades. Taking advantage of new technologies and vastly improved management systems, Michigan leads all states in the production of seven crops and ranks second or third in the production of six others. Michigan's abundant land and water resources and its nearness to major markets provide the potential and opportunity for continued growth and profitability for agriculture and agriculture-related industries.

To capitalize on the opportunity for development, an Agricultural Experiment Station project, the "Status and Potential of Michigan Agriculture" (SAPMA), has taken inventory of relevant research, identified trends and future scenarios in Michigan agriculture, and assessed the potential for growth. The results of this project will assist the MAES in establishing priorities and program planning.

Approximately 70 faculty members and graduate students prepared 30 drafts of reports on the various commodity groups and industry sectors. These reports were reviewed by 100 other faculty members. During MSU's Agriculture and Natural Resources Week in March of this year, nearly 150 industry representatives attended a conference on SAPMA and offered their input to the reports. The authors then produced final versions of 10 Phase I reports, which provide general background information on the future economic, social, political and technical environment for agriculture, and 20 Phase II reports, which focus on major agricultural enterprises in the state. The reports are available to commodity groups and other interested people.

These SAPMA reports and other sources of information, such as the Extension issues identification process and the College of Agriculture and Natural Resources strategic planning process, will be the basis for joint research and Extension planning. MAES administrators will be working with Vice Provost and Dean Fred Poston and Extension Director Gail Imig in this effort.

The reports will also be the basis for interdisciplinary and basic research competitive grants by the Agricultural Experiment Station. We have issued calls for proposals and will initiate the research program in 1993.

1992 was the second year of the MAES leadership intern program. Sponsored by the national Experiment Station





*"To capitalize on the opportunity for development, an [AES] project . . . has taken inventory of relevant research, identified trends and future scenarios in Michigan agriculture, and assessed the potential for growth."*

Committee on Organization and Policy (ESCOP) and the Cooperative State Research Service (CSRS), the program was created in recognition of the need to develop future leadership for the agricultural experiment station system. Vincent Bralts, associate professor of agricultural engineering; Ivan Mao, professor of animal science; and M. Suzanne Sontag, professor of human environment and design, were the three interns chosen this year.

In other personnel matters, William Taylor was appointed chairperson of the Department of Fisheries and Wildlife, and Larry Hamm was named chairperson of the Department of Agricultural Economics.

At the 1992 Ag Expo breakfast in July, the governor unveiled his plan to award MSU \$500,000 for the architecture fees for the Michigan Animal Agriculture Initiative. Citing the initiative as an important collaboration between MSU, the industry and state government, Gov. Engler pledged to work to make the remaining components of the initiative a reality.

The money will fund architecture fees for the renovation of Anthony Hall and the Dairy Plant; the renovation of and addition to the Meats Lab; the renovation and improvement of University Farms buildings; and the design of the new Livestock and Education Center and the new Animal Infectious Disease Containment Facility. Four architecture firms have been selected for the project.

Though planning money was appropriated for a crop and soil sciences field laboratory at the corner of Mt. Hope and Beaumont roads, the state budget situation has put construction on hold for an additional year.

1993 will bring a new series of challenges and opportunities for Michigan agriculture and natural resources. By continuing to identify and provide solutions to the problems of Michigan's citizens, the Michigan Agricultural Experiment Station is positioned to propel Michigan agriculture and natural resources forward and prepare them to be competitive in the next century.

Robert G. Gast

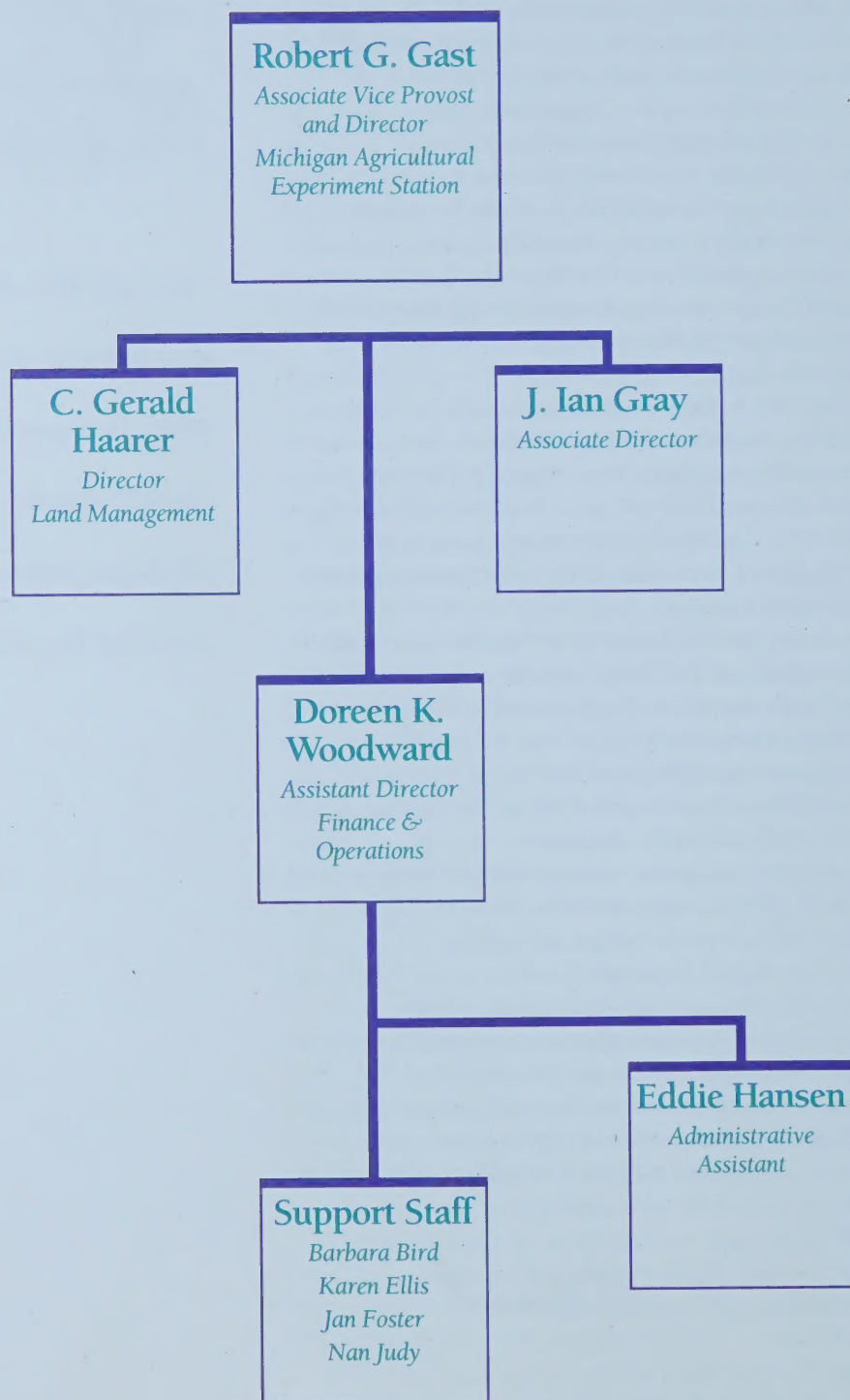
Director

Michigan Agricultural Experiment Station

# Agricultural Experiment Station

## Organizational Flow Chart

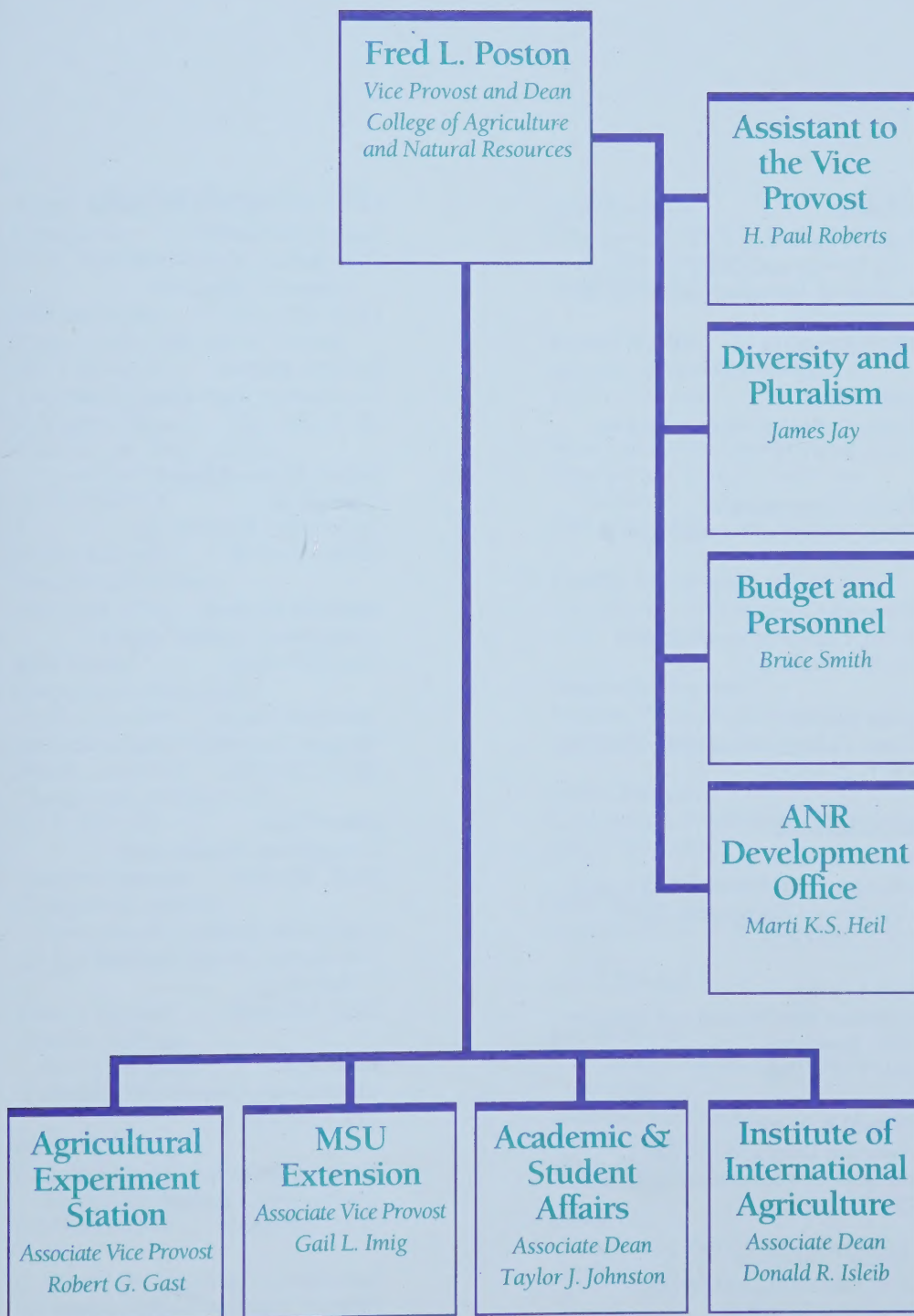
As of 10-1-92



# College of Agriculture And Natural Resources

## Office of Vice Provost and Dean

As of 10-1-92





# AES Affiliated Deans, Directors, and Unit Administrators

As of 10-1-92

## DEANS

**Fred L. Poston**  
Vice Provost and Dean  
College of Agriculture and Natural  
Resources  
(517) 355-0233

**Julia Miller**  
Dean, College of Human Ecology  
(517) 355-7714

**Frank Hoppensteadt**  
Dean, College of Natural Science  
(517) 355-4473

**Kenneth Corey**  
Dean, College of Social Science  
(517) 355-6675

**John Tasker**  
Dean, College of Veterinary Medicine  
(517) 355-6509

## DIRECTORS

**Robert G. Gast**  
Associate Vice Provost and Director  
Agricultural Experiment Station  
(517) 355-0123

**Gail L. Imig**  
Associate Vice Provost and Director  
MSU Extension  
(517) 355-2308

**Donald R. Isleib**  
Associate Dean and Director  
Institute of International Agriculture  
(517) 355-0174

**Taylor J. Johnston**  
Associate Dean and Director  
Academic Programs  
(517) 355-0234

## UNIT ADMINISTRATORS

**Carroll Wamhoff**  
Chairperson, Agricultural &  
Extension Education  
(517) 355-6580

**Larry G. Hamm**  
Chairperson, Agricultural Economics  
(517) 355-4567

**Robert D. von Bernuth**  
Chairperson,  
Agricultural Engineering  
(517) 353-7268

**Maynard Hogberg**  
Chairperson, Animal Science  
(517) 355-8384

**Maxine S. Ferris**  
Manager, Outreach Communications  
(517) 336-1555

**John Wilson**  
Chairperson, Biochemistry  
(517) 353-0804

**Gustaaf de Zoeten**  
Chairperson, Botany & Plant  
Pathology  
(517) 355-4688

**Eldor Paul**  
Chairperson, Crop & Soil Sciences  
(517) 355-0262

**Mark Scriber**  
Chairperson, Entomology  
(517) 355-4665

**Lawrence J. Fischer**  
Director, Institute for Environmental  
Toxicology  
(517) 353-6469



**Robert Griffore**  
Chairperson, Family & Child Ecology  
(517) 355-7680

**William Taylor**  
Chairperson, Fisheries & Wildlife  
(517) 353-0647

**P. Vincent Hegarty**  
Chairperson, Food Science  
& Human Nutrition  
(517) 355-8476

**Daniel Keathley**  
Chairperson, Forestry  
(517) 355-0093

**Judy Olson**  
Chairperson, Geography  
(517) 355-4649

**Wayne Loescher**  
Chairperson, Horticulture  
(517) 355-5191

**Timothy Springer**  
Chairperson, Human  
Environment & Design  
(517) 355-7712

**Patrick Webber**  
Director, Kellogg  
Biological Station  
(616) 671-5117

**Frederik Derksen**  
Chairperson, Large Animal  
Clinical Sciences  
(517) 355-0593

**C. Gerald Haarer**  
Director, Land Management  
(517) 355-3272

**Jerry Dodgson**  
Chairperson, Microbiology  
& Public Health  
(517) 355-6465

**Harold Hughes**  
Director, School of Packaging  
(517) 353-6462

**Betty van der Smissen**  
Chairperson, Park & Recreation  
Resources  
(517) 353-0822

**Charles Mackenzie**  
Chairperson, Pathology  
(517) 353-9160

**Robert Hollingworth**  
Director, Pesticide Research Center  
(517) 353-9430

**John Chimoskey**  
Chairperson, Physiology  
(517) 355-4488

**Peter Wolk**  
Director, MSU-DOE Plant Research  
Lab  
(517) 353-2270

**Jon Bartholic**  
Coordinator, Center for Remote  
Sensing  
Director, Institute for  
Water Research  
(517) 355-3421

**Frank Fear**  
Chairperson, Resource Development  
(517) 355-3421

**Chris Vanderpool**  
Chairperson, Sociology  
(517) 355-6632

# Agricultural Experiment Station Outlying Stations

10-1-92

## 1. East Lansing Field Research Facilities

*Established 1888*

109 Agriculture Hall  
East Lansing, MI 48824-1039  
Phone: (517) 355-3272  
C. Gerald Haarer  
*Director, Land Management*

## 2. Clarksville Horticultural Experiment Station

*Established 1974*

Box 77A  
9302 Portland Road  
Clarksville, MI 48815  
Phone: (616) 693-2193  
Gerald Skeltis  
*Farm Manager*

## 3. Dunbar Forest Experiment Station

*Established 1925*

Rt. 1, Box 179  
Sault Ste. Marie, MI 49783  
Phone: (906) 786-1575  
Ray Miller  
*Forester*

## 4. W.K. Kellogg Biological Station and W.K. Kellogg Forest

*Established 1928*

3700 E. Gull Lake Drive  
Hickory Corners, MI 49060  
Phone: (616) 671-5117  
Bernie Knezek (616) 671-2324  
*Director, Agricultural Programs*  
Patrick Webber (616) 671-2323  
*Director, Programs and Development*  
Greg Kowalewski (616) 731-4597  
*Resident Forester*

## 5. Lake City Experiment Station

*Established 1928*

Lake City, MI 49651  
Phone: (616) 839-4608  
Doug Nielsen  
*Farm Manager*

## 6. Montcalm Experimental Farm

*Established 1966*

Rt. 1  
Lakeview, MI 48850  
Phone: (517) 365-3473  
Richard Crawford  
*Technician*

## 7. Muck Soils Research Farm

*Established 1941*

Rt. 3  
9422 E. Herbison Road  
Laingsburg, MI 48848  
Phone: (517) 641-4062  
Ronald Gnagey  
*Field Research Technician*

## 8. Northwest Michigan Horticultural Research Station

*Established 1979*

6686 S. Center Highway  
Traverse City, MI 49684  
Phone: (616) 946-1510  
James Nugent  
*Coordinator*  
Bill Klein  
*Farm Manager*

## 9. Fred Russ Forest Experiment Station

*Established 1942*

Rt. 2 Marcellus Highway  
Decatur, MI 49045  
Phone: (616) 782-5652  
Greg Kowalewski  
*Forester*  
Scott Newland  
*Research Assistant*

## 10. Saginaw Valley Beet and Bean Research Farm

*Established 1971*

3066 S. Thomas Road  
Saginaw, MI 48603  
Phone: (517) 781-1160  
Paul Horny  
*Farm Manager*

## 11. SW Michigan Research & Extension Center

*Established 1987*

1791 Hillandale Road  
Benton Harbor, MI 49022  
Phone: (616) 944-1477  
James Ertman  
*Farm Manager*  
Tom Zabadal  
*Station Coordinator*

## 12. Trevor Nichols Research Complex

*Established 1967*

6237 124th Avenue  
Fennville, MI 49408  
Phone: (616) 561-5040  
Matthew Daly  
*Farm Manager*

## 13. Upper Peninsula Experiment Station

*Established 1899*

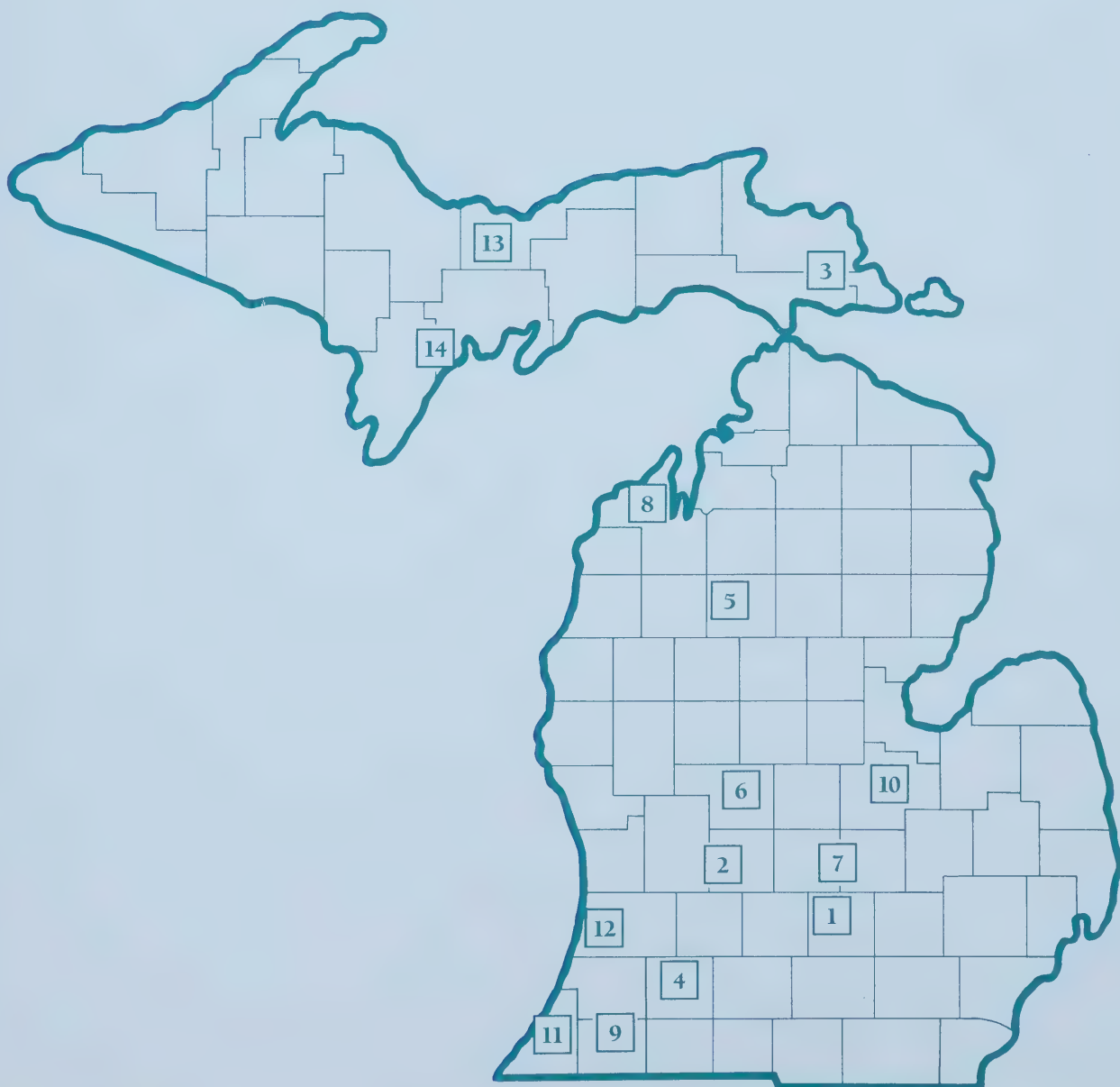
Chatham, MI 49816  
Phone: (906) 439-5114  
Paul Naasz  
*Farm Manager*

## 14. Upper Peninsula Tree Improvement Center

*Established 1986*

6005 J Road  
Escanaba, MI 49829  
Phone: (906) 786-1575  
Ray Miller  
*Resident Forester*





# Alphabetical List of AES Scientists

As of 10-1-92

Faculty members with dual appointments are listed in both of the departments in which they serve.

NAME	DEPARTMENT
Adams, Gerard C.	Botany & Plant Pathology
Allen, Michael	Animal Science
Allison, Richard	Botany & Plant Pathology
Anderson, James H.	Agricultural Engineering
Anderson, Richard L.	Biochemistry
Anderson, Sharon J.	Crop & Soil Sciences
Aulerich, Richard J.	Animal Science
Axinn, George	Resource Development
Ayers, George S.	Entomology
Baker, John C.	Large Animal Clinical Sciences
Bakker-Arkema, Fred W.	Agricultural Engineering
Balander, Richard J.	Animal Science
Beaudry, Randolph M.	Horticulture
Bell, Thomas G.	Pathology
Bennink, Maurice R.	Human Nutrition
Benson, Margaret	Animal Science
Bergen, Werner G.	Animal Science
Berglund, Kris A.	Agricultural Engineering
Bickert, William G.	Agricultural Engineering
Biernbaum, John A.	Horticulture
Bird, George W.	Entomology
Black, J. Roy	Agricultural Economics
Bokemeier, Janet L.	Sociology
Bond, Jenny T.	Human Nutrition
Bonnen, James T.	Agricultural Economics
Booren, Alden M.	Food Science
Boyd, Stephen A.	Crop & Soil Sciences
Bralts, Vincent F.	Agricultural Engineering
Branham, Bruce E.	Crop & Soil Sciences
Breznak, John A.	Microbiology & Public Health
Bronstein, Daniel A.	Resource Development
Brook, Roger C.	Agricultural Engineering
Bucholtz, Herbert F.	Animal Science
Bukovac, Martin J.	Horticulture
Burkhardt, Thomas H.	Agricultural Engineering
Bursian, Steven	Animal Science
Burton, Zachary	Biochemistry
Busch, Lawrence M.	Sociology
Bush, Guy L.	Kellogg Biological Station
Cameron, Arthur C.	Horticulture
Campa, Henry III	Fisheries & Wildlife
Carlson, William H.	Horticulture
Cash, Jerry N.	Food Science
Champhess, Wendy C.	Microbiology & Public Health

NAME	DEPARTMENT
Chang, Timothy S.	Animal Science
Chappelle, Daniel E.	Forestry
Chappelle, Daniel E.	Resource Development
Chase, Richard W.	Crop & Soil Sciences
Chenoweth, Wanda L.	Human Nutrition
Chou, Karen	Animal Science
Christenson, Donald R.	Crop & Soil Sciences
Coe, Paul H.	Animal Science
Cook, Robert M.	Animal Science
Coon, Thomas G.	Fisheries & Wildlife
Coussens, Paul M.	Animal Science
Cress, Charles E.	Crop & Soil Sciences
Crum, James L.	Crop & Soil Sciences
Dazzo, Frank B.	Microbiology & Public Health
de Bruijn, Frans J.	Microbiology & Public Health
de Bruijn, Frans J.	Plant Research Laboratory
Denison, Michael	Biochemistry
Dennis, Frank G., Jr.	Horticulture
Dersch, Eckhart	Resource Development
Dickmann, Donald I.	Forestry
Diers, Brian	Crop & Soil Sciences
Dilley, David R.	Horticulture
Douches, David S.	Crop & Soil Sciences
Dukelow, W. Richard	Animal Science
Dukelow, W. Richard	Physiology
Edens, Thomas C.	Entomology
Edens, Thomas C.	Resource Development
Ellis, Boyd G.	Crop & Soil Sciences
Emery, Roy S.	Animal Science
Erskine, Ronald J.	Large Animal Clinical Sciences
Ewart, Lowell C.	Horticulture
Ferris, John N.	Agricultural Economics
Ferris, Theodore A.	Animal Science
Flegal, Cal J.	Animal Science
Flore, James A.	Horticulture
Fogwell, Ralph L.	Animal Science
Foster, Eunice F.	Crop & Soil Sciences
Fraker, Pamela J.	Biochemistry
Freed, Russell D.	Crop & Soil Sciences
Fridgen, Joseph D.	Park & Recreation Resources
Fried, Jeremy S.	Forestry
Fullbright, Dennis W.	Botany & Plant Pathology
Gage, Stuart H.	Entomology
Garling, Donald L.	Fisheries & Wildlife



NAME	DEPARTMENT
Gerrish, John B.	Agricultural Engineering
Giacin, Jack R.	Packaging
Giesy, John P.	Fisheries & Wildlife
Gill, John L.	Animal Science
Grafius, Edward J.	Entomology
Graham-Tomasi, Theodore	Agricultural Economics
Graham, Richard L.	Human Environment & Design
Gray, J. Ian	Food Science
Grimes, Sheila D.	Pathology
Gulke, Eric A.	Agricultural Engineering
Grumet, Rebecca	Horticulture
Guyer, Daniel E.	Agricultural Engineering
Hammerschmidt, Raymond	Botany & Plant Pathology
Hancock, James F.	Horticulture
Hanson, Eric J.	Horticulture
Hanson, Steven D.	Agricultural Economics
Harpstead, Dale D.	Crop & Soil Sciences
Harris, Craig K.	Sociology
Harsh, Stephen B.	Agricultural Economics
Hart, James B., Jr.	Forestry
Hart, John H.	Botany & Plant Pathology
Hart, L. Patrick	Botany & Plant Pathology
Harwood, Richard R.*	Crop & Soil Sciences
Haufler, Jonathan B.	Fisheries & Wildlife
Hausbeck, Mary K.	Botany & Plant Pathology
Hausinger, Robert P.	Microbiology & Public Health
Hawkins, David R.	Animal Science
Haynes, Dean L.	Entomology
Heins, Royal D.	Horticulture
Heinze, Kirk L.	Ag & Extension Education
Helferich, William G.	Food Science
Herdt, Thomas H.	Large Animal Clinical Sciences
Hernandez, Ruben J.	Packaging
Herner, Robert C.	Horticulture
Hesterman, Oran B.	Crop & Soil Sciences
Hoehn, John P.	Agricultural Economics
Hoerr, Sharon M.	Human Nutrition
Holecek, Donald F.	Park & Recreation Resources
Holland, John F.	Biochemistry
Holland, Robert E.	Large Animal Clinical Sciences
Hoopingarner, Roger A.	Entomology
Hootman, Seth R.	Physiology
Howell, Gordon S.	Horticulture
Hull, Jerome, Jr.	Horticulture
Iezzoni, Amy F.	Horticulture
Imig, David R.	Family & Child Ecology
Ireland, James J.	Animal Science
Jacobs, Lee W.	Crop & Soil Sciences
Jarosz, Andrew	Botany & Plant Pathology
Johnson, James W.	Entomology
Johnson, Nan E.	Sociology
Jones, Alan L.	Botany & Plant Pathology
Kaguni, Jon M.	Biochemistry
Kakela, Peter J.	Resource Development
Kaneene, John B.	Large Animal Clinical Sciences
Keefe, Dennis R.	Family & Child Ecology
Keith, Joanne G.	Family & Child Ecology
Kells, James J., Jr.	Crop & Soil Sciences

NAME	DEPARTMENT
Kelly, James D.	Crop & Soil Sciences
Kelly, John F.	Horticulture
Kevern, Niles R.	Fisheries & Wildlife
Kielbaso, Julian J.	Forestry
Kimball, William J.	Resource Development
Kindel, Paul K.	Biochemistry
Klug, Michael J.	Microbiology & Public Health
Knezek, Bernard D.	Crop & Soil Sciences
Kroos, Lee	Biochemistry
Kunze, Raymond J.	Crop & Soil Sciences
Lacy, Melvyn L.	Botany & Plant Pathology
Landis, Douglas A.	Entomology
Lantagne, Douglas O.	Forestry
Leefers, Larry A.	Forestry
Leep, Richard H.	Crop & Soil Sciences
Lee, Julian J. L.	Packaging
Lenski, Richard E.***	Crop & Soil Sciences
Levine, S. Joseph	Ag & Extension Education
Linz, John E.	Food Science
Lloyd, James W.	Agricultural Economics
Lohr, Luanne	Agricultural Economics
Loudon, Theodore L.	Agricultural Engineering
Maes, Roger K.	Microbiology & Public Health
Manderscheid, Lester V.	Agricultural Economics
Manthy, Robert S.	Forestry
Mao, Ivan Ling	Animal Science
McCullough, Deborah G.	Entomology
McDonough, Maureen H.	Forestry
McGroarty, Estelle J.	Biochemistry
McNabb, Clarence D.	Fisheries & Wildlife
Merkel, Robert A.	Animal Science
Merkel, Robert A.	Food Science
Merritt, Richard W.	Entomology
Merva, George E.	Agricultural Engineering
Miller, Elwyn R.	Animal Science
Miller, James R.	Entomology
Mokma, Delbert L.	Crop & Soil Sciences
Moline, Waldimar J.	Crop & Soil Sciences
Mrozowski, Timothy	Agricultural Engineering
Myers, Robert S.	Agricultural Economics
Nair, Muraleedharan G.	Horticulture
Nelson, Charles M.	Park & Recreation Resources
Ng, Perry K. W.	Food Science
Oehmke, James F.	Agricultural Economics
Ofoli, Robert Y.	Agricultural Engineering
Ofoli, Robert Y.	Food Science
Ohlrogge, John	Botany & Plant Pathology
Olsen, Larry G.	Pesticide Research Center
Padgett, George A.	Pathology
Partridge, John A.	Food Science
Patterson, Jon S.	Pathology
Penner, Donald	Crop & Soil Sciences
Perry, Ronald L.	Horticulture
Person, Howard L.	Agricultural Engineering
Pestka, James J.	Food Science
Peterson, H. Christopher	Agricultural Economics
Peyton, R. Benny	Fisheries & Wildlife
Pierce, J. Francis	Crop & Soil Sciences

NAME	DEPARTMENT
Potter-Witter, Karen L.	Forestry
Pregitzer, Kurt S.	Forestry
Preiss, Jack	Biochemistry
Price, James F.	Food Science
Prince, Harold H.	Fisheries & Wildlife
Raikhel, Alexander S.	Entomology
Ramm, Carl W.	Forestry
Ramsdell, Donald C.	Botany & Plant Pathology
Reddy, C. Adinarayana	Microbiology & Public Health
Render, James A.	Pathology
Renner, Karen A.	Crop & Soil Sciences
Ricks, Donald J.	Agricultural Economics
Rieke, Paul E.	Crop & Soil Sciences
Ries, Stanley K.	Horticulture
Ritchie, Harlan D.	Animal Science
Ritchie, Joe T. **	Crop & Soil Sciences
Robertson, G. Phillip	Crop & Soil Sciences
Robinson, Norman E.	Large Animal Clinical Sciences
Robison, Lindon J.	Agricultural Economics
Rogers, John N. III.	Crop & Soil Sciences
Romsos, Dale R.	Human Nutrition
Rust, Steven	Animal Science
Safir, Gene R.	Botany & Plant Pathology
Sawyer, Carol A.	Human Nutrition
Schemmel, Rachelle A.	Human Nutrition
Schiamberg, Lawrence R.	Family & Child Ecology
Schindler, Melvin	Biochemistry
Schmid, A. Allan	Agricultural Economics
Schultink, Gerhardus	Resource Development
Schutzki, Robert E.	Horticulture
Schwab, Gerald D.	Agricultural Economics
Schwarzweiler, Harry K.	Sociology
Schweikhardt, David B.	Agricultural Economics
Sears, Barbara	Botany & Plant Pathology
Seeger, Larry J.	Agricultural Engineering
Shaffer, James D.	Agricultural Economics
Sink, Kenneth C.	Horticulture
Skidmore, Andrew	Animal Science
Sleight, Stuart D.	Pathology
Slocum, Ann C.	Human Environment & Design
Smith, Denise M.	Food Science
Smitley, David R.	Entomology
Smucker, A.J.M.	Crop & Soil Sciences
Somerville, Shauna	Plant Research Laboratory
Song, Won O.	Human Nutrition
Sontag, M. Suzanne	Human Environment & Design
Srivastava, Ajit K.	Agricultural Engineering
Staat, John S.	Agricultural Economics
Steffe, James F.	Agricultural Engineering
Steffe, James F.	Food Science
Stehr, Frederick W.	Entomology
Sternquist, Brenda J.	Human Environment & Design
Stevens, James A.	Forestry
Stowe, Howard D.	Animal Science
Stowe, Howard D.	Large Animal Clinical Sciences
Strasburg, Gale M.	Food Science
Stynes, Daniel J.	Park & Recreation Resources
Suchsland, Otto M.	Forestry

NAME	DEPARTMENT
Surbrook, Truman C.	Agricultural Engineering
Swinton, Scott M.	Agricultural Economics
Thacker, Brad J.	Large Animal Clinical Sciences
Thomashow, Michael F.	Crop & Soil Sciences
Thomashow, Michael F.	Microbiology & Public Health
Tiedje, James M.	Crop & Soil Sciences
Tiedje, James M.	Microbiology & Public Health
Triezenberg, Steven	Biochemistry
Tucker, H. Allen	Animal Science
Uebersax, Mark A.	Food Science
Uffen, Robert L.	Microbiology & Public Health
Ullrey, Duane E.	Animal Science
Ustunol, Zeynep	Food Science
Van Ee, Gary R.	Agricultural Engineering
van Ravenswaay, Eileen O.	Agricultural Economics
VandeHaar, Michael	Animal Science
Vander Stoep, Gail A.	Park & Recreation Resources
Vargas, Joseph M., Jr.	Botany & Plant Pathology
Velicer, Leland F.	Microbiology & Public Health
Vitosh, Maurice L.	Crop & Soil Sciences
Vlasin, Ray	Resource Development
Walker, Edward D.	Entomology
Walker, Rosemary	Family & Child Ecology
Wang, John L.	Biochemistry
Ward, Richard W.	Crop & Soil Sciences
Warncke, Darryl D.	Crop & Soil Sciences
Watson, J. Throck	Biochemistry
Weber, Michael T.	Agricultural Economics
Whalon, Mark E.	Entomology
Whims, Fred	Ag & Extension Education
Widders, Irvin E.	Horticulture
Wilkinson, Robert H.	Agricultural Engineering
Winterstein, Scott R.	Fisheries & Wildlife
Yokoyama, Melvin T.	Animal Science
Yumkella, Kandeh K.	Agricultural Economics
Zabadal, Thomas J.	Horticulture
Zabik, Mary E.	Human Nutrition
Zabik, Matthew J.	Entomology
Zabik, Matthew J.	Pesticide Research Center
Zandstra, Bernard H.	Horticulture
Zile, Maija H.	Human Nutrition
Zipser, Birgit	Physiology

\*C.S. Mott Distinguished Professor of Sustainable Agriculture

\*\*Nowlin Professor for Water Research

\*\*\*Hannah Professor for Microbial Ecology and Plant Sciences



# List of AES Scientists by Department

As of 10-1-92

The names listed here represent the faculty members who have an AES appointment and are in the tenure stream as of 10-1-92. Faculty members with dual appointments are listed in both of the departments in which they serve.

## KEY:

U Gen = College of Agriculture & Natural Resources University General

AES = Agricultural Experiment Station

CES = Cooperative Extension Service

Joint = Joint Appointment in Another College or Department

12 = Professor

13 = Associate Professor

14 = Assistant Professor



NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Heinze, Kirk L.	14	0.80	0.20	0.00	0.00	0.00	Communication
Levine, S. Joseph	12	0.30	0.20	0.50	0.00	0.00	Faculty Development
Whims, Fred	12	0.20	0.40	0.40	0.00	0.00	Extension Education
<b>TOTALS:</b>		<b>1.30</b>	<b>0.80</b>	<b>0.90</b>	<b>0.00</b>	<b>0.00</b>	

## Ag & Extension Education

Ph: 355-6580

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Black, J. Roy	12	0.20	0.80	0.00	0.00	0.00	Farm Management
Bonnen, James T.	12	0.15	0.85	0.00	0.00	0.00	Public Policy
Ferris, John N.	12	0.15	0.20	0.65	0.00	0.00	Outlook & Prices
Graham-Tomasi, Theodore	13	0.35	0.65	0.00	0.00	0.00	Resource Economics
Hanson, Steven D.	14	0.20	0.80	0.00	0.00	0.00	Agricultural Finance
Harsh, Stephen B.	12	0.15	0.20	0.65	0.00	0.00	Farm Management
Hoehn, John P.	13	0.30	0.70	0.00	0.00	0.00	Resource Development
Lloyd, James W.	14	0.00	0.20	0.00	0.00	0.80	Livestock Prod/Hlth Mgt/ Food Safety
Lohr, Luanne	14	0.20	0.25	0.55	0.00	0.00	Resource Economics
Manderscheid, Lester V.	12	0.24	0.31	0.45	0.00	0.00	Macroeconomics
Myers, Robert S.	13	0.20	0.80	0.00	0.00	0.00	Int'l Trade & Price Analysis
Oehmke, James F.	13	0.25	0.75	0.00	0.00	0.00	Price Analysis & Research Policy

## Agricultural Economics

Ph: 355-4563

## Agricultural Economics

(continued)

Peterson, H. Christopher	14	0.60	0.40	0.00	0.00	0.00	Agribusiness
Ricks, Donald J.	12	0.10	0.20	0.70	0.00	0.00	Marketing
Robison, Lindon J.	12	0.35	0.65	0.00	0.00	0.00	Production Economics
Schmid, A. Allan	12	0.40	0.60	0.00	0.00	0.00	Land Economics/Public Policy
Schwab, Gerald D.	12	0.30	0.20	0.50	0.00	0.00	Farm Management
Schweikhardt, David B.	14	0.35	0.25	0.40	0.00	0.00	Agricultural Trade Policy
Shaffer, James D.	12	0.30	0.70	0.00	0.00	0.00	Marketing/Agricultural Policy
Staatz, John S.	12	0.75	0.25	0.00	0.00	0.00	Int'l Development
Swinton, Scott M.	14	0.30	0.70	0.00	0.00	0.00	Production Economics
van Ravenswaay, Eileen O.	12	0.25	0.75	0.00	0.00	0.00	Public Policy/Food Safety
Weber, Michael T.	12	0.20	0.80	0.00	0.00	0.00	International Development
Yumkella, Kandeh K.	14	0.60	0.40	0.00	0.00	0.00	Int'l Trade-Export Marketing
<b>TOTALS:</b>		<b>6.89</b>	<b>12.41</b>	<b>3.90</b>	<b>0.00</b>	<b>0.80</b>	

## Agricultural Engineering

Ph: 355-4720

	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Anderson, James H.	12	0.67	0.16	0.17	0.00	0.00	Administration/Power Mach.
Bakker-Arkema, Fred W.	12	0.35	0.65	0.00	0.00	0.00	Grain Dry/Storage
Berglund, Kris A.	12	0.30	0.30	0.00	0.00	0.40	Biotechnology/Food Engineering
Bickert, William G.	12	0.00	0.20	0.80	0.00	0.00	Livestock Facilities/Environment
Bralts, Vincent F.	13	0.30	0.50	0.00	0.00	0.20	Soil & Water/International Program
Brook, Roger C.	12	0.00	0.25	0.75	0.00	0.00	Postharvest Handling/Storage, Drying
Burkhardt, Thomas H.	12	0.60	0.25	0.00	0.00	0.15	Power & Machine Systems & Storage
Gerrish, John B.	12	0.50	0.40	0.00	0.00	0.10	Electronic Robotics
Grulke, Eric A.	12	0.00	0.25	0.00	0.00	0.75	Mass Transfer/Separation/Food Engr.
Guyer, Daniel E.	14	0.00	0.25	0.75	0.00	0.00	Fruit/Vegetable Storage/Handling
Loudon, Theodore L.	12	0.00	0.30	0.70	0.00	0.00	Pollution Management/Irrigation
Merva, George E.	12	0.50	0.50	0.00	0.00	0.00	Irrigation/Drainage
Mrozowski, Timothy	13	0.80	0.20	0.00	0.00	0.00	Building Construction Management
Ofoli, Robert Y.	13	0.50	0.25	0.00	0.00	0.25	Heat/Mass Trsf of Bio Sys/Food Engr.
Person, Howard L.	13	0.00	0.30	0.70	0.00	0.00	Agricultural Structures/Livestock
Segerlind, Larry J.	12	0.60	0.40	0.00	0.00	0.00	Finite Element Analysis



Srivastava, Ajit K.	12	0.40	0.50	0.00	0.00	0.10	Power & Mach. Systems/ Hydraulics
Steffe, James F.	12	0.40	0.35	0.00	0.00	0.25	Food Engineering/ Rheology
Surbrook, Truman C.	12	0.15	0.25	0.00	0.00	0.60	Electrical Technology
Van Ee, Gary R.	13	0.25	0.65	0.00	0.00	0.10	Chem. Application/ Power & Machinery
Wilkinson, Robert H.	13	0.15	0.15	0.60	0.00	0.10	Human Factors Eng/ Chem Application
<b>TOTALS:</b>		<b>6.47</b>	<b>7.06</b>	<b>4.47</b>	<b>0.00</b>	<b>3.00</b>	

## Agricultural Engineering

(continued)

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Allen, Michael	14	0.00	0.50	0.50	0.00	0.00	Forage Nutrition
Aulerich, Richard J.	12	0.00	0.75	0.25	0.00	0.00	Fur-bearing Animals
Balander, Richard J.	13	0.60	0.40	0.00	0.00	0.00	Avian Physiology/ Reproduction
Benson, Margaret	13	0.30	0.20	0.50	0.00	0.00	Ruminant Nutrition in Sheep
Bergen, Werner G.	12	0.20	0.80	0.00	0.00	0.00	Ruminant Nutrition/ Growth Bioliology
Bucholtz, Herbert F.	12	0.00	0.20	0.80	0.00	0.00	Dairy Nutrition/ Management
Bursian, Steven	12	0.15	0.85	0.00	0.00	0.00	Avian Physiology/ Toxicology
Chang, Timothy S.	12	0.15	0.85	0.00	0.00	0.00	M&PH/Poultry Pathology
Chou, Karen	14	0.20	0.80	0.00	0.00	0.00	Toxicology
Coe, Paul H.	13	0.00	0.20	0.00	0.00	0.80	Animal Health
Cook, Robert M.	12	0.20	0.80	0.00	0.00	0.00	Ruminant Nutrition
Coussens, Paul M.	14	0.20	0.80	0.00	0.00	0.00	Molecular Biology
Dukelow, Richard	12	0.00	0.25	0.00	0.00	0.75	Reproductive Physiology
Emery, Roy S.	12	0.00	0.80	0.00	0.00	0.20	Ruminant Nutrition
Ferris, Theodore A.	13	0.00	0.20	0.80	0.00	0.00	Dairy Genetics
Flegel, Cal J.	12	0.00	0.35	0.65	0.00	0.00	Avian Nutrition/ Management
Fogwell, Ralph L.	12	0.40	0.60	0.00	0.00	0.00	Physiology
Gill, John L.	12	0.50	0.50	0.00	0.00	0.00	Statistics Genet.
Hawkins, David R.	12	0.65	0.15	0.00	0.00	0.20	Beef Cattle Nutrition/ Management
Ireland, James J.	12	0.20	0.80	0.00	0.00	0.00	Physiology
Mao, Ivan Ling	12	0.25	0.75	0.00	0.00	0.00	Dairy Genetics
Merkel, Robert A.	12	0.50	0.25	0.00	0.00	0.25	Growth Biology/Meat Science
Miller, Elwyn R.	12	0.00	0.85	0.00	0.00	0.15	Swine Nutrition
Ritchie, Harlan D.	12	0.00	0.10	0.90	0.00	0.00	Beef Cattle Nutrition/ Management
Rust, Steven	13	0.00	0.50	0.50	0.00	0.00	Beef Feedlot Nutrition

## Animal Science

Ph: 355-8383

## Animal Science

(continued)

Skidmore, Andrew	14	0.25	0.25	0.50	0.00	0.00	Dairy Management
Stowe, Howard D.	12	0.00	0.45	0.00	0.00	0.55	Clinical Nutrition
Tucker, H. Allen	12	0.20	0.80	0.00	0.00	0.00	Physiology/Lactation
Ullrey, Duane E.	12	0.40	0.60	0.00	0.00	0.00	Animal Nutrition
VandeHaar, Michael	14	0.35	0.65	0.00	0.00	0.00	Dairy Nutrition
Yokoyama, Melvin T.	12	0.15	0.85	0.00	0.00	0.00	Animal Nutrition/ Microbiology
<b>TOTALS:</b>		<b>5.85</b>	<b>16.85</b>	<b>5.40</b>	<b>0.00</b>	<b>2.90</b>	

## Biochemistry

Ph: 355-1600

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Anderson, Richard L.	12	0.45	0.25	0.00	0.00	0.30	Carbohydrate Metabolism
Burton, Zachary	14	0.00	0.20	0.00	0.00	0.80	Molecular Biology
Denison, Michael	14	0.15	0.65	0.00	0.00	0.20	Toxicology/Molecular Biology
Fraker, Pamela J.	12	0.00	0.44	0.00	0.00	0.56	Immunology
Holland, John F.	12	0.00	0.80	0.00	0.00	0.20	Analytical Biochemistry
Kaguni, Jon M.	13	0.00	0.58	0.00	0.00	0.42	Molecular Biology
Kindel, Paul K.	12	0.20	0.60	0.00	0.00	0.20	Plant Biochemistry
Kroos, Lee	14	0.20	0.60	0.00	0.00	0.20	Molecular Biology
McGroarty, Estelle J.	12	0.50	0.40	0.00	0.00	0.10	Lipid/Protein Biochemistry
Preiss, Jack	12	0.24	0.10	0.00	0.00	0.66	Plant Biochemistry
Schindler, Melvin	12	0.00	0.35	0.00	0.00	0.65	Cell Biology
Triezenberg, Steven	14	0.00	0.20	0.00	0.00	0.80	Molecular Biology
Wang, John L.	12	0.00	0.20	0.00	0.00	0.80	Cell Biology
Watson, J. Throck	12	0.00	0.50	0.00	0.00	0.50	Analytical Biochemistry
<b>TOTALS:</b>		<b>1.74</b>	<b>5.87</b>	<b>0.00</b>	<b>0.00</b>	<b>6.39</b>	

## Botany & Plant Pathology

Ph: 355-4683

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Adams, Gerard C.	13	0.00	0.22	0.60	0.00	0.18	Plant Pathology
Allison, Richard	14	0.00	0.90	0.00	0.00	0.10	Molecular Virology
Fulbright, Dennis W.	12	0.00	1.00	0.00	0.00	0.00	Wheat Pathology
Hammerschmidt, Raymond	12	0.00	0.90	0.00	0.00	0.10	Plant Pathology
Hart, John H.	12	0.00	0.50	0.00	0.00	0.50	Plant Pathology
Hart, L. Patrick	12	0.00	0.50	0.50	0.00	0.00	Plant Pathology
Hausbeck, Mary K.	14	0.00	0.39	0.61	0.00	0.00	Plant Pathology
Jarosz, Andrew	14	0.00	0.80	0.00	0.00	0.20	Plant Pathology
Jones, Alan L.	12	0.00	0.50	0.50	0.00	0.00	Plant Pathology
Lacy, Melvyn L.	12	0.00	0.40	0.50	0.00	0.10	Plant Pathology
Ohlrogge, John	12	0.00	0.84	0.00	0.00	0.16	Plant Physiology
Ramsdell, Donald C.	12	0.00	0.50	0.50	0.00	0.00	Plant Virology Pathology
Safir, Gene R.	12	0.00	0.90	0.00	0.00	0.10	Plant Pathology



Sears, Barbara	13	0.00	0.25	0.00	0.00	0.75	Molecular Genetics
Vargas, Joseph M., Jr.	12	0.00	0.50	0.15	0.00	0.35	Plant Pathology
<b>TOTALS:</b>		<b>0.00</b>	<b>9.10</b>	<b>3.36</b>	<b>0.00</b>	<b>2.54</b>	

## Botany & Plant Pathology

(continued)

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Anderson, Sharon J.	14	0.25	0.75	0.00	0.00	0.00	Surface Soil Chemistry
Boyd, Stephen A.	12	0.25	0.75	0.00	0.00	0.00	Organic Chemistry
Branham, Bruce E.	13	0.25	0.75	0.00	0.00	0.00	Turfgrass Physiology
Chase, Richard W.	12	0.10	0.25	0.65	0.00	0.00	Crop Management
Christenson, Donald R.	12	0.00	0.50	0.50	0.00	0.00	Soil Fertilizer Management
Cress, Charles E.	12	0.90	0.10	0.00	0.00	0.00	Applied Statistics
Crum, James L.	13	0.60	0.25	0.00	0.00	0.15	Soil Class/Genesis
Diers, Brian	14	0.25	0.75	0.00	0.00	0.00	Soybean Breeding/Genetics
Douches, David S.	14	0.10	0.90	0.00	0.00	0.00	Potato Breeding/Genetics
Ellis, Boyd G.	12	0.50	0.50	0.00	0.00	0.00	Soil Chemistry
Foster, Eunice F.	13	0.85	0.15	0.00	0.00	0.00	Crop Physiology
Freed, Russell D.	12	0.25	0.50	0.00	0.00	0.25	Int'l Agronomy/Plant Breeding
Harpstead, Dale D.	12	0.24	0.62	0.14	0.00	0.00	Int'l Agriculture/Crop Production
Harwood, Richard R.*	12	0.20	0.60	0.20	0.00	0.00	Sustainable Agriculture
Hesterman, Oran B.	13	0.00	0.23	0.77	0.00	0.00	Alfalfa/Forage Production
Jacobs, Lee W.	12	0.00	0.50	0.50	0.00	0.00	Extension Environmental Specialist
Kells, James J., Jr.	12	0.15	0.25	0.60	0.00	0.00	Weed Science
Kelly, James D.	13	0.25	0.75	0.00	0.00	0.00	Dry Bean Breeding
Knezek, Bernard D.	12	0.50	0.50	0.00	0.00	0.00	Micronutrition Waste Utilization
Kunze, Raymond J.	12	0.38	0.62	0.00	0.00	0.00	Soil Physics
Leep, Richard H.	12	0.00	0.50	0.50	0.00	0.00	Soil Fertilization & Extension
Lenski, Richard E.***	12	0.10	0.40	0.00	0.00	0.50	Microbial Ecol.& Evolutionary Biol.
Mokma, Delbert L.	12	0.50	0.50	0.00	0.00	0.00	Soil Classification/Genesis
Moline, Waldimar J.	12	0.25	0.25	0.50	0.00	0.00	Forage Physiology
Penner, Donald	12	0.20	0.80	0.00	0.00	0.00	Crop Physiology
Pierce, J. Francis	13	0.30	0.70	0.00	0.00	0.00	Soil Management Systems
Renner, Karen A.	13	0.00	0.50	0.50	0.00	0.00	Weed Science
Rieke, Paul E.	12	0.00	0.35	0.50	0.00	0.15	Turfgrass Management
Ritchie, Joe T.**	12	0.00	0.00	0.50	0.50	0.00	Soil Physics/Plant Stress
Robertson, G. Phillip	13	0.22	0.38	0.00	0.00	0.40	Ecosystem Ecology
Rogers, John N. III.	14	0.25	0.25	0.00	0.00	0.50	Turfgrass Management

## Crop & Soil Sciences

Ph: 355-0271

## Crop & Soil Sciences

(continued)

Smucker, A.J.M.	12	0.25	0.75	0.00	0.00	0.00	Soil Biophysics
Thomashow, Michael F.	12	0.10	0.76	0.00	0.00	0.14	Plant & Microbial Molecular Gen.
Tiedje, James M.	12	0.25	0.60	0.00	0.00	0.15	Soil Microbiology
Vitosh, Maurice L.	12	0.00	0.30	0.70	0.00	0.00	Soil Fertilization Management
Ward, Richard W.	14	0.25	0.75	0.00	0.00	0.00	Wheat Breeding
Warncke, Darryl D.	12	0.00	0.50	0.50	0.00	0.00	Grnhouse/Vegetable Soil Fert.
<b>TOTALS:</b>		<b>8.69</b>	<b>18.51</b>	<b>7.06</b>	<b>0.50</b>	<b>2.24</b>	

## Entomology

Ph: 355-4662

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Ayers, George S.	12	0.00	0.10	0.00	0.00	0.90	IPM/Apiculture
Bird, George W.	12	0.00	0.40	0.50	0.00	0.10	Agricultural Nematology
Edens, Thomas C.	12	0.00	0.20	0.00	0.00	0.80	Resource Economics & Policy
Gage, Stuart H.	12	0.00	0.75	0.00	0.00	0.25	Env. Sys./Ent. Sur.
Grafius, Edward J.	12	0.00	0.50	0.50	0.00	0.00	Vegetable Insect Eco. Management
Haynes, Dean L.	12	0.00	0.75	0.00	0.00	0.25	Insect Population Ecology
Hoopingarner, Roger A.	12	0.00	0.10	0.70	0.00	0.20	Apiculture & Pollination
Johnson, James W.	14	0.00	0.25	0.75	0.00	0.00	Fruit Insect Ecology
Landis, Douglas A.	14	0.00	0.25	0.75	0.00	0.00	Field Forage Insect
McCullough, Deborah G.	14	0.00	0.30	0.50	0.00	0.20	Forest Entomology
Merritt, Richard W.	12	0.00	0.50	0.00	0.00	0.50	Aquatic Insect Ecology
Miller, James R.	12	0.00	0.50	0.00	0.00	0.50	Insect Physiology
Raikhel, Alexander S.	12	0.00	0.10	0.00	.00	0.90	Insect Physiology
Smitley, David R.	13	0.00	0.40	0.60	0.00	0.00	Landscape/Ornamental Insect Ecology
Stehr, Frederick W.	12	0.00	0.50	0.00	0.00	0.50	Insect Biocon./System.
Walker, Edward D.	14	0.00	0.33	0.33	0.00	0.34	Medical/Veterinary Entomology
Whalon, Mark E.	12	0.00	0.63	0.00	0.00	0.37	Insect Vector Dynam.
Zabik, Matthew J.	12	0.00	0.10	0.00	0.00	0.90	Environmental Toxicology
<b>TOTALS:</b>		<b>0.00</b>	<b>6.66</b>	<b>4.63</b>	<b>0.00</b>	<b>6.71</b>	



NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Imig, David R.	13	0.00	0.25	0.00	0.00	0.75	Family Ecology
Keefe, Dennis R.	14	0.00	0.50	0.00	0.00	0.50	Family Economics
Keith, Joanne G.	12	0.00	0.10	0.80	0.00	0.10	Human Develop Family
Schiamberg, Lawrence R.	12	0.00	0.30	0.00	0.00	0.70	Human Develop Family
Walker, Rosemary	13	0.00	0.50	0.00	0.00	0.50	Family Economics
<b>TOTALS:</b>		<b>0.00</b>	<b>1.65</b>	<b>0.80</b>	<b>0.00</b>	<b>2.55</b>	

## Family & Child Ecology

Ph: 355-7680

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Campa, Henry III	14	0.50	0.50	0.00	0.00	0.00	Wildlife Habitat Ecology
Coon, Thomas G.	14	0.50	0.50	0.00	0.00	0.00	Fisheries
Garling, Donald L.	12	0.20	0.30	0.50	0.00	0.00	Aquaculture
Giesy, John P.	12	0.35	0.55	0.00	0.00	0.10	Toxicology
Haufler, Jonathan B.	12	0.50	0.50	0.00	0.00	0.00	Wildlife Ecol. Forest
Kevern, Niles R.	12	0.50	0.50	0.00	0.00	0.00	Limnology/Fisheries
McNabb, Clarence D.	12	0.26	0.74	0.00	0.00	0.00	Limnology
Peyton, R. Benny	12	0.58	0.42	0.00	0.00	0.00	Environmental Education
Prince, Harold H.	12	0.45	0.55	0.00	0.00	0.00	Waterfowl/Wetlands
Winterstein, Scott R.	14	0.50	0.50	0.00	0.00	0.00	Wildlife Biometry
<b>TOTALS:</b>		<b>4.34</b>	<b>5.06</b>	<b>0.50</b>	<b>0.00</b>	<b>0.10</b>	

## Fisheries & Wildlife

Ph: 355-4477

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Booren, Alden M.	12	0.10	0.15	0.75	0.00	0.00	Meat/Poultry/Fish
Cash, Jerry N.	12	0.00	0.25	0.75	0.00	0.00	Fruit/Vegetable Products
Gray, J. Ian	12	0.00	0.25	0.00	0.00	0.75	Food Chemistry
Helferich, William G.	14	0.35	0.65	0.00	0.00	0.00	Food Toxicology
Linz, John E.	13	0.50	0.50	0.00	0.00	0.00	Food Microbiology
Merkel, Robert A.	12	0.00	0.25	0.00	0.00	0.75	Growth Biology
Ng, Perry K. W.	14	0.50	0.50	0.00	0.00	0.00	Cereal Science
Ofoli, Robert Y.	13	0.00	0.25	0.00	0.00	0.75	Heat/Mass Trsf of Bio Sys/Food Engr.
Partridge, John A.	13	0.25	0.25	0.50	0.00	0.00	Dairy Technology
Pestka, James J.	12	0.50	0.50	0.00	0.00	0.00	Food Microbiology
Price, James F.	12	0.50	0.50	0.00	0.00	0.00	Meat/Poultry Prod.
Smith, Denise M.	13	0.40	0.60	0.00	0.00	0.00	Poultry/Egg Prod.
Steffe, James F.	12	0.00	0.25	0.00	0.00	0.75	Food Engineering/Rheology
Strasburg, Gale M.	14	0.40	0.60	0.00	0.00	0.00	Muscle Biochemistry
Uebersax, Mark A.	12	0.40	0.60	0.00	0.00	0.00	Fruit/Vegetable Products
Ustunol, Zeynep	14	0.50	0.50	0.00	0.00	0.00	Dairy Foods
<b>TOTALS:</b>		<b>4.40</b>	<b>6.60</b>	<b>2.00</b>	<b>0.00</b>	<b>3.00</b>	

## Food Science

Ph: 355-8474

## Forestry

Ph: 355-0090

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Chappelle, Daniel E.	12	0.00	0.33	0.00	0.00	0.67	Resource Economics & Policy
Dickmann, Donald I.	12	0.30	0.70	0.00	0.00	0.00	Tree Physiology
Fried, Jeremy S.	14	0.50	0.50	0.00	0.00	0.00	Forest Management
Hart, James B., Jr.	13	0.50	0.50	0.00	0.00	0.00	Forest Soils
Kielbaso, Julian J.	12	0.60	0.15	0.25	0.00	0.00	Urban Forestry
Lantagne, Douglas O.	13	0.00	0.20	0.80	0.00	0.00	Silviculture
Leefers, Larry A.	13	0.50	0.50	0.00	0.00	0.00	Forest Economics
Manthy, Robert S.	12	0.50	0.50	0.00	0.00	0.00	Forest Economics
McDonough, Maureen H.	12	0.35	0.15	0.50	0.00	0.00	Forest Sociology
Potter-Witter, Karen L.	13	0.10	0.55	0.35	0.00	0.00	Forest Economics
Pregitzer, Kurt S.	12	0.30	0.70	0.00	0.00	0.00	Forest Ecology
Ramm, Carl W.	13	0.40	0.60	0.00	0.00	0.00	Forest Biometrics
Stevens, James A.	14	0.10	0.60	0.30	0.00	0.00	Trade Economics
Suchsland, Otto M.	12	0.20	0.80	0.00	0.00	0.00	Wood Science
<b>TOTALS:</b>		<b>4.35</b>	<b>6.78</b>	<b>2.20</b>	<b>0.00</b>	<b>0.67</b>	

## Horticulture

Ph: 355-5191

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Beaudry, Randolph M.	14	0.00	0.50	0.50	0.00	0.00	Postharvest Physiology/ Fruit & Veg.
Biernbaum, John A.	13	0.45	0.20	0.00	0.00	0.35	Plant Physiology/ Floriculture
Bukovac, Martin J.	12	0.10	0.90	0.00	0.00	0.00	Plant Physiology/ Pomology
Cameron, Arthur C.	13	0.30	0.70	0.00	0.00	0.00	Plant Physiology/ Landscape Hort.
Carlson, William H.	12	0.15	0.35	0.50	0.00	0.00	Floriculture/Physiology & Bedding
Dennis, Frank G., Jr.	12	0.60	0.40	0.00	0.00	0.00	Plant Physiology/ Pomology
Dilley, David R.	12	0.20	0.80	0.00	0.00	0.00	Postharvest Physiology/ Pomology
Ewart, Lowell C.	12	0.10	0.60	0.00	0.00	0.30	Floral/Onion Breeding
Flore, James A.	12	0.35	0.65	0.00	0.00	0.00	Plant Physiology/ Pomology
Grumet, Rebecca	14	0.10	0.90	0.00	0.00	0.00	Vegetable Breeding/ Genetics
Hancock, James F.	12	0.10	0.90	0.00	0.00	0.00	Small Fruit Breeding/ Genetics
Hanson, Eric J.	13	0.00	0.35	0.65	0.00	0.00	Pomology Small Fruits
Heins, Royal D.	12	0.25	0.75	0.00	0.00	0.00	Plant Physiology/ Floriculture
Herner, Robert C.	12	0.35	0.65	0.00	0.00	0.00	Postharvest Physiology/ Veg. Crop
Howell, Gordon S.	12	0.20	0.80	0.00	0.00	0.00	Plant Physiology/ Viticulture/Enology

Hull, Jerome, Jr.	12	0.00	0.20	0.80	0.00	0.00	Pomology/Physiology & Culture
Iezzoni, Amy F.	13	0.20	0.80	0.00	0.00	0.00	Fruit Breeding/Genetics
Kelly, John F.	12	0.23	0.66	0.11	0.00	0.00	Vegetable Composition
Nair, Muraleedharan G.	14	0.50	0.50	0.00	0.00	0.00	Natural Products/Chemistry
Perry, Ronald L.	13	0.00	0.50	0.50	0.00	0.00	Pomology/Rootstocks
Ries, Stanley K.	12	0.20	0.80	0.00	0.00	0.00	Plant Physiology/Vegetable
Schutzki, Robert E.	14	0.15	0.10	0.00	0.00	0.75	Landscape Horticulture
Sink, Kenneth C.	12	0.25	0.75	0.00	0.00	0.00	Genetics/Plant Breeding
Widders, Irvin E.	13	0.25	0.75	0.00	0.00	0.00	Vegetable Physiology
Zabadal, Thomas J.	13	0.00	0.50	0.50	0.00	0.00	Viticulture
Zandstra, Bernard H.	12	0.00	0.25	0.75	0.00	0.00	Vegetable Crops
<b>TOTALS:</b>		<b>5.03</b>	<b>15.26</b>	<b>4.31</b>	<b>0.00</b>	<b>1.40</b>	

## Horticulture

(continued)

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Graham, Richard L.	13	0.00	0.25	0.00	0.00	0.75	Interior Design/Hist. Preservation
Slocum, Ann C.	13	0.00	0.25	0.00	0.00	0.75	Apparel Design & Textiles
Sontag, M. Suzanne	12	0.00	0.25	0.00	0.00	0.75	Apparel Design & Textiles
Sternquist, Brenda J.	12	0.00	0.25	0.00	0.00	0.75	Tourism/Merc. Management
<b>TOTALS:</b>		<b>0.00</b>	<b>1.00</b>	<b>0.00</b>	<b>0.00</b>	<b>3.00</b>	

## Human Environment & Design

Ph: 355-7712

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Bennink, Maurice R.	12	0.00	0.50	0.00	0.00	0.50	Nutrition
Bond, Jenny T.	12	0.00	0.40	0.00	0.00	0.60	Nutrition
Chenoweth, Wanda L.	12	0.00	0.25	0.00	0.00	0.75	Nutrition
Hoerr, Sharon M.	13	0.00	0.25	0.00	0.00	0.75	Community Nutrition
Romsos, Dale R.	12	0.00	0.70	0.00	0.00	0.30	Lipid Metabolism
Sawyer, Carol A.	13	0.00	0.25	0.00	0.00	0.75	Food Service Management
Schemmel, Rachelle A.	12	0.00	0.30	0.00	0.00	0.70	Nutrition
Song, Won O.	13	0.00	0.25	0.00	0.00	0.75	Nutrition
Zabik, Mary E.	12	0.00	0.20	0.00	0.00	0.80	Foods
Zile, Maija H.	12	0.00	0.50	0.00	0.00	0.50	Nutrition
<b>TOTALS:</b>		<b>0.00</b>	<b>3.60</b>	<b>0.00</b>	<b>0.00</b>	<b>6.40</b>	

## Human Nutrition

Ph: 355-8474



## Kellogg Biological Station

Ph: (616) 671-5117

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Bush, Guy L.	12	0.00	0.10	0.00	0.00	0.90	Genetics
<b>TOTALS:</b>		<b>0.00</b>	<b>0.10</b>	<b>0.00</b>	<b>0.00</b>	<b>0.90</b>	

## Large Animal Clinical Sciences

Ph: 355-9593

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Baker, John C.	13	0.00	0.20	0.00	0.00	0.80	Bovine Respiratory Diseases
Erskine, Ronald J.	14	0.00	0.25	0.33	0.00	0.42	Mastitis in Dairy Cattle
Herd, Thomas H.	13	0.00	0.25	0.00	0.00	0.75	Nutr.& Metabolic Diseases of Cattle
Holland, Robert E.	14	0.00	0.34	0.00	0.00	0.66	Bovine Enteric Disease
Kaneene, John B.	12	0.00	0.14	0.00	0.00	0.86	Epidemiology/Disease Impact
Robinson, Norman E.	12	0.00	0.25	0.00	0.00	0.75	Respiratory Physiology
Stowe, Howard D.	12	0.00	0.30	0.00	0.00	0.70	Clinical Nutrition
Thacker, Brad J.	13	0.00	0.28	0.30	0.00	0.42	Swine Medicine
<b>TOTALS:</b>		<b>0.00</b>	<b>2.01</b>	<b>0.63</b>	<b>0.00</b>	<b>5.36</b>	

## Microbiology & Public Health

Ph: 355-6463

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Breznak, John A.	12	0.00	0.30	0.00	0.00	0.70	Microbial Ecology
Champness, Wendy C.	14	0.00	0.50	0.00	0.00	0.50	Microbial Genetics
Dazzo, Frank B.	12	0.00	0.80	0.00	0.00	0.20	Microbial Ecology
de Bruijn, Frans J.	13	0.00	0.29	0.00	0.00	0.71	Molecular Biology
Hausinger, Robert P.	13	0.00	0.40	0.00	0.00	0.60	Microbial Physiology
Klug, Michael J.	12	0.00	0.25	0.00	0.00	0.75	Microbial Ecology
Maes, Roger K.	12	0.00	0.03	0.00	0.00	0.97	Virology
Reddy, C. Adinarayana	12	0.00	0.46	0.00	0.00	0.54	Microbial Physiology/ Ecology
Thomashow, Michael F.	12	0.00	0.14	0.00	0.00	0.86	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.00	0.15	0.00	0.00	0.85	Soil Microbiology
Uffen, Robert L.	12	0.00	0.49	0.00	0.00	0.51	Microbial Physiology
Velicer, Leland F.	12	0.00	0.30	0.00	0.00	0.70	Virology
<b>TOTALS:</b>		<b>0.00</b>	<b>4.11</b>	<b>0.00</b>	<b>0.00</b>	<b>7.89</b>	

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Giacin, Jack R.	12	0.50	0.50	0.00	0.00	0.00	Package Product Interaction
Hernandez, Ruben J.	14	0.50	0.50	0.00	0.00	0.00	Package Product Interaction
Lee, Julian J. L.	13	0.80	0.20	0.00	0.00	0.00	CAP/MAP & Protective Packaging
<b>TOTALS:</b>		<b>1.80</b>	<b>1.20</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	

## Packaging

Ph: 355-9580

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Fridgen, Joseph D.	12	0.40	0.60	0.00	0.00	0.00	Leisure/Env. Perc.
Holecek, Donald F.	12	0.00	0.75	0.25	0.00	0.00	Resource Economics/ Tourism
Nelson, Charles M.	14	0.50	0.25	0.25	0.00	0.00	Outdoor Recreation Resource Mgmt.
Stynes, Daniel J.	12	0.50	0.50	0.00	0.00	0.00	System Analysis & Planning
Vander Stoep, Gail A.	14	0.50	0.25	0.25	0.00	0.00	Communications/ Human Dimensions
<b>TOTALS:</b>		<b>1.90</b>	<b>2.35</b>	<b>0.75</b>	<b>0.00</b>	<b>0.00</b>	

## Park & Recreation

Ph: 355-5190

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Bell, Thomas G.	12	0.00	0.25	0.00	0.00	0.75	Compar. Pathology/ Platelet Function
Grimes, Sheila D.	14	0.00	0.36	0.00	0.00	0.64	Enteric Diseases of Animals
Padgett, George A.	12	0.00	0.25	0.00	0.00	0.75	Comparative Veterinary Pathology
Patterson, Jon S.	14	0.00	0.25	0.00	0.00	0.75	Vet Pathology/Infectious Dis./Ani.
Render, James A.	13	0.00	0.23	0.00	0.00	0.77	Ophthalmic Pathology
Sleight, Stuart D.	12	0.00	0.50	0.00	0.00	0.50	Toxicologic Pathology
<b>TOTALS:</b>		<b>0.00</b>	<b>1.84</b>	<b>0.00</b>	<b>0.00</b>	<b>4.16</b>	

## Pathology

Ph: 353-9160

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Olsen, Larry G.	13	0.00	0.10	0.75	0.00	0.15	Pesticide Education & IPM
Zabik, Matthew J.	12	0.00	0.84	0.00	0.00	0.16	Environmental Toxicology
<b>TOTALS:</b>		<b>0.00</b>	<b>0.94</b>	<b>0.75</b>	<b>0.00</b>	<b>0.31</b>	

## Pesticide Research Center

Ph: 353-9430

## Physiology

Ph: 355-6475

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Dukelow, W. Richard	12	0.00	0.40	0.00	0.00	0.60	Reproductive Physiology
Hootman, Seth R.	13	0.00	0.50	0.00	0.00	0.50	Cellular Physiology
Zipser, Birgit	12	0.00	0.47	0.00	0.00	0.53	Cell Biology
<b>TOTALS:</b>		<b>0.00</b>	<b>1.37</b>	<b>0.00</b>	<b>0.00</b>	<b>1.63</b>	

## Plant Research Lab

Ph: 353-2270

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
de Bruijn, Frans J.	13	0.00	0.31	0.00	0.00	0.69	Molecular Biology
Somerville, Shauna	13	0.00	0.75	0.00	0.00	0.25	Plant Pathology
<b>TOTALS:</b>		<b>0.00</b>	<b>1.06</b>	<b>0.00</b>	<b>0.00</b>	<b>0.94</b>	

## Resource Development

Ph: 355-3421

NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTEREST
		U GEN	AES	CES	GRANT	JOINT	
Axinn, George	12	0.17	0.50	0.00	0.00	0.33	Community & Regional Development
Bronstein, Daniel A.	12	0.60	0.40	0.00	0.00	0.00	Environmental Policy & Law
Chappelle, Daniel E.	12	0.60	0.07	0.00	0.00	0.33	Res. Econ. & Policy
Dersch, Eckhart	12	0.22	0.17	0.61	0.00	0.00	Natural Resources Management
Edens, Thomas C.	12	0.00	0.80	0.00	0.00	0.20	Resource Economics & Policy
Kakela, Peter J.	12	0.20	0.80	0.00	0.00	0.00	Natural Resources Management
Kimball, William J.	12	0.20	0.10	0.70	0.00	0.00	Community & Regional Development
Schultink, Gerhardus	13	0.75	0.25	0.00	0.00	0.00	Natural Resources Management
Vlasin, Ray	12	0.30	0.30	0.40	0.00	0.00	Community & Regional Development
<b>TOTALS:</b>		<b>3.04</b>	<b>3.39</b>	<b>1.71</b>	<b>0.00</b>	<b>0.86</b>	



NAME	RANK	FULL TIME EMPLOYEE—PERCENT					AREA OF INTERES
		U GEN	AES	CES	GRANT	JOINT	
Bokemeier, Janet L.	12	0.00	0.50	0.00	0.00	0.50	Farm Family/Labor Markets
Busch, Lawrence M.	12	0.00	0.50	0.00	0.00	0.50	Struc. of Agr. Sci./Agr. Res. Policy
Harris, Craig K.	13	0.00	0.50	0.00	0.00	0.50	Sociology of Agriculture
Johnson, Nan E.	12	0.00	0.50	0.00	0.00	0.50	Demography
Schwarzweiler, Harry K.	12	0.00	0.50	0.00	0.00	0.50	Sociology of Agriculture
<b>TOTALS:</b>		<b>0.00</b>	<b>2.50</b>	<b>0.00</b>	<b>0.00</b>	<b>2.50</b>	

# Sociology

Ph: 355-6632

<b>GRAND TOTALS</b>	<b>55.80</b>	<b>138.08</b>	<b>42.62</b>	<b>0.50</b>	<b>64.10</b>
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\*C.S. Mott Distinguished Professor of Sustainable Agriculture

\*\*Nowlin Professor for Water Research

\*\*\*Hannah Professor for Microbial Ecology and Plant Sciences

# List of Active AES Projects\* by Department

\*Signifies Regional Research Project

As of 10-1-92



## Agricultural Economics

Project 442	Economics of Agricultural Development and Change	Johnson, G.
Project 996	Assessments of Consumer Reactions to New Food Products and Marketing Services	Zehner, M.
Project 1502	The Performance of Coordinating Functions and Institutions of the U.S. Food System	Staatz, J.
Project 1518*	Benefits and Costs in Natural Resource Planning	Hoehn, J.
Project 1519*	Private Strategies, Public Policies and Food System Performance	van Ravenswaay, E.
Project 1530*	Competition and Change in the Fruit and Vegetable Production and Marketing Systems	Ricks, D.
Project 1566*	The Organization and Performance of World Food Systems: Implications for U.S. Policy	Shaffer, J.
Project 1567*	Quantifying Long-Run Agricultural Risks and Evaluating Farmer Responses to Risk	Robison, L.
Project 1572	Agricultural and Rural Institutions in Productivity and Growth	Bonnen, J.
Project 1576*	Farm Information Systems	Harsh, S.
Project 1588*	Impacts of Transportation Changes on Agricultural Marketing and Local Communities	Hanson, S.
Project 1592*	Analyses of Selected Economic Factors Affecting the Long-Run Viability of the Northern Dairy Industry	Hamm, L.
Project 1618*	Modeling Responses of Growing Pigs	Schwab, G.
Project 1625	Financial Decision Making and Investment in Agriculture	Hanson, S.
Project 1635	Collective Action in Agriculture, Natural Resources and Rural Development	Schmid, A.
Project 1650	Effects of Macroeconomic Fluctuations and Government Stabilization Policies on U.S. Agriculture	Myers, R.
Project 1653	The Political Economy of U.S. Agricultural Research, Commodity and Trade Policy	Oehmke, J.
Project 1660*	Regulatory, Efficiency and Management Issues Affecting Rural Financial Markets	Hanson, S.
Project 1666*	Impact Analyses and Decision Strategies for Agricultural Research	Oehmke, J.
Project 1669	Developing Econometric Models for the Agricultural and Food Sectors	Ferris, J.
Project 1682	Application of Present Value Techniques for Financing, Design and Selection of Durables	Robison, L.
Project 1690	Livestock Health Management Economics and the Safety of Animal-Origin Foods	Lloyd, J.
Project 3131	Agricultural Economics Research: Problems of Less-Developed Countries	Weber, M.
Project 3333	Improved Marketing and Marketing Systems for Fruits and Vegetables	Ricks, D.
Project 3800	Risk Perception, Measurement and Analysis: Groundwater, Food and Rural Areas	Hoehn, J.

## Agricultural Economics

(continued)

Project 3806	<b>Engineering and Economic Potential for Wet and Dry Manure Products On-Farm and in the Marketplace</b>	Lohr, L.
Project 3807	<b>An Analysis of the Status of Michigan Agriculture and Research and Extension Implications</b>	Ferris, J.
Project 3809	<b>Financial Evaluation of Alternative Production Strategies for Michigan Dairy Farms</b>	Harsh, S.
Project 3812	<b>Evaluating Alternative Design and Management Systems for the Michigan Beef Cattle Industry</b>	Black, J.

## Agricultural & Extension Education

Project 3314	<b>Educational Perspectives of Agricultural Researchers and Scientists</b>	Levine, S.
Project 3316	<b>Assessing Retailer/Consumer Perceptions and Use of Michigan Produced Commodities</b>	Heinze, K.

## Agricultural Engineering

Project 1245*	<b>Improvement of Thermal Processes for Food</b>	Steffe, J.
Project 1361*	<b>Marketing and Delivery of Quality Cereals and Oilseeds</b>	Bakker-Arkema, F.
Project 1548	<b>Bio-Catalyzed Reactive Extrusion of Carbohydrates</b>	Ofoli, R.
Project 1564*	<b>The Effect of Water Table Management on Productivity and Water Quality</b>	Merva, G.
Project 1577	<b>Systems for Value-Added Processing of Food and Agricultural Products</b>	Srivastava, A.
Project 1578	<b>Water Management and Transport in Biological and Agricultural Systems</b>	Merva, G.
Project 1579	<b>Development of Machine Concepts for Mechanized Agriculture</b>	Ledebuhr, R.
Project 1580	<b>Storage and Handling of Agricultural Crops</b>	Brook, R.
Project 1581	<b>Value-Added Quality Control Techniques in the Postharvest Stages of Fruit and Vegetable Products</b>	Guyer, D.
Project 1582	<b>Sensors and Automatic Control in Agriculture</b>	Gerrish, J.
Project 1583	<b>Development of Chemical Application Technology for the Agribusiness Industry</b>	Van Ee, G.
Project 1591*	<b>Microirrigation for Optimum Crop Productivity and Minimum Groundwater Contamination</b>	Bralts, V.
Project 1594	<b>Influence of Environment on Animal Performance and Behavior</b>	Bickert, W.
Project 1603	<b>Modelling Machinery Systems for Field Crop Production</b>	Burkhardt, T.
Project 1627*	<b>Microirrigation of Horticultural Crops in Humid Regions</b>	Bralts, V.
Project 1659	<b>Design, Evaluation and Management of Irrigation Systems</b>	Bralts, V.
Project 1676*	<b>Technology and Principles for Assessing and Retaining Quality of Fruits and Vegetables</b>	Srivastava, A.
Project 1686	<b>Engineering Science and Design of Solid Fermentations</b>	Grulke, E.
Project 3293	<b>Great Lakes Influence on Michigan Climate</b>	Nurnberger, F.
Project 3303	<b>Deposition Efficiency of Chemical Application</b>	Wilkinson, R.
Project 3344	<b>Alternative Systems Development for Sustainable Pasture Rearing of Swine in an Intensive Land Use Environment</b>	Person, H.
Project 7560	<b>Bioprocessing for Utilization of Agricultural Raw Materials</b>	Berglund, K.
Project 7574	<b>Animal Waste Management Strategies for Michigan</b>	von Bernuth, R.
Project 7576	<b>Water Quality Impacts of Water Table Management</b>	Belcher, H.



# Anatomy

Project 6860	Peptidergic Mediation of Arthritis/Laminitis Disease	Bowker, R.
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## Animal Science

Project 44	Biological and Biochemical Effects of Certain Nutritional and Physical Factors in Swine	Miller, E.
Project 859	Hormonal Control of Reproduction in Cattle, Sheep and Swine	Dukelow, W.
Project 1039	Fur Animal Studies (Mink)	Aulerich, R.
Project 1156*	Dairy Herd Management Strategies for Improved Decision Making and Profitability	Skidmore, A.
Project 1163	Factors Controlling Growth and Lactation	Tucker, H.
Project 1178	Breeding Strategies to Maximize Economic Gain in Dairy Cattle Production	Mao, I.
Project 1182*	Factors Regulating Protein Synthesis, Degradation, and Growth in Skeletal Muscle	Bergen, W.
Project 1196*	Methods for Improvement of Fertility in Cows Postpartum	Fogwell, R.
Project 1226	Protein and Amino Acid Nutrition and Metabolism in Ruminants	Bergen, W.
Project 1278	Improvement of Design and Analysis of Animal Experiments	Gill, J.
Project 1318	Utilization of Fiber by Ruminants	Cook, R.
Project 1437	Increasing Milk Solids Secretion	Emery, R.
Project 1450	Poultry Disease Studies of Current Significance	Chang, T.
Project 1521*	Metabolic Relationships in Supply of Nutrients for Lactating Cows	Emery, R.
Project 1528*	Skeletal Problems in Poultry	Flegal, C.
Project 1573	The Physiological Role of Ovarian Inhibins	Ireland, J.
Project 1575*	Increased Efficiency of Sheep Production	Benson, M.
Project 1596*	The Genetics of Body Composition in Beef	Ritchie, H.
Project 1604	Nutritional Regulation of Protein Production in Ruminants	VandeHaar, M.
Project 1616	Regulation of Skeletal Muscle Growth by Sex Steroids and Growth Modifiers	Merkel, R.
Project 1622	Automated In-Vitro Test System for Chemical Toxicity in Mammalian Sperm	Chou, K.
Project 1639	Comparative Nutrition and Physiology of Wild Animals	Ullrey, D.
Project 1643	Microbial Ecology of the Rumen, Gastrointestinal Tract, and Ensiled Feeds	Yokoyama, M.
Project 1645	Using Traditional and Non-Traditional Pedigree Information to Select Bulls for AI Sampling Programs	Ferris, T.
Project 1652*	Assessment of Technological Changes in Forage-Dairy Production Systems Using Computer Modelling	Allen, M.
Project 1675	Molecular Characterization of Marek's Disease Virus (MDV)	Coussens, P.
Project 3014	Maximum Utilization of Michigan-Grown Feedstuffs for Growing and Finishing Cattle	Rust, S.
Project 3047	Feeding and Management Regimes for Efficient Utilization of Michigan Feedstuffs by Beef Cattle	Ritchie, H.
Project 3117	Nutrition and Physiology of the Horse	Ullrey, D.
Project 3217	The Fate and Biological Effects of Xenobiotics in Farm Animal Species	Bursian, S.
Project 3304	Basic and Applied Studies Utilizing Domestic and Semi-Domestic Avian Species as Research Animals	Balander, R.
Project 3307	Optimizing the Nutritional Utilization of Forages by Dairy Cattle	Allen, M.
Project 3325	Management Studies in Poultry to Include Waste Handling/Utilization	Flegal, C.
Project 3340	Nutrition and Feeding Management for Michigan Dairy Herds	Bucholtz, H.
Project 3341	<i>Corpora lutea</i> and Reproduction in Lactating Dairy Cows	Fogwell, R.

## Animal Science

(continued)

Project 3342	<b>Dairy Herd Management Strategies for Improved Profitability and Productivity</b>	Skidmore, A.
Project 6845	<b>Characterizations of Shifts in Cecal Bacterial Fermentation Induced by Growth-Promoting Antibiotics</b>	Yokoyama, M.
Project 6868	<b>Preovulatory Follicular Events Mediate Adverse Effects of Energy Deficit on Bovine Luteal Function</b>	Fogwell, R.
Project 7549	<b>Photoperiod Regulation of Lactation</b>	Tucker, H.
Project 7568	<b>Development of Recombinant Marek's Disease Vaccine Virus</b>	Coussens, P.
Project 8058	<b>Regulatory Regions of Marek's Disease Virus</b>	Coussens, P.
Project 8073	<b>The Role of Inhibins in Ovarian Function</b>	Ireland, J.
Project 8102	<b>Aminergic Regulation of Growth Hormone Secretion in Cattle</b>	Tucker, H.
Project 8104	<b>Functional Role of Bacteriophages in the Rumen Ecosystem</b>	Yokoyama, M.

## Biochemistry

Project 1219	<b>Plant Respiration</b>	Tolbert, N.
Project 1223	<b>The Interrelationships Between Dietary Zinc Status and Immune Function</b>	Fraker, P.
Project 1290*	<b>Regulation of Photosynthetic Processes</b>	Preiss, J.
Project 1503	<b>Regulation of Starch Metabolism in Photosynthetic and Non-Photosynthetic Processes</b>	Preiss, J.
Project 1543	<b>Role of Carnitine Acyltransferases in the Regulation of Cellular Metabolism</b>	Bieber, L.
Project 1546	<b>Development of a Computerized Fluorimeter and its Application to Chemical and Biochemical Problems</b>	Holland, J.
Project 1547	<b>Development of Quantitative Vapor Phase Methodology for Steroids</b>	Watson, J.
Project 1586	<b>Molecular Mechanisms of Action of Halogenated Aromatic Hydrocarbons</b>	Denison, M.
Project 1598	<b>Temporal and Spatial Gene Regulation in <i>Bacillus subtilis</i></b>	Kroos, L.
Project 1601	<b>DNA Replication and its Regulation in <i>Escherichia coli</i></b>	Kaguni, J.
Project 1608	<b>Activation of Gene Expression by a Herpes Simplex Virion Protein</b>	Triezenberg, S.
Project 1609	<b>Expression of Carbohydrate Binding Protein 35 in Fibroblasts as a Function of Replicative Life Span</b>	Anderson, R.
Project 1610	<b>Transcription Factors that Bind to RNA Polymerase II</b>	Burton, Z.
Project 1614	<b>Interaction of <i>Rhizobium</i> with Soybean Cells</b>	Wang, J.
Project 1621	<b>Transmembrane and Intracellular Signalling in Soybean Cells</b>	Schindler, M.
Project 1668	<b>Detection and Characterization of Two Different Structural Types of Pectic Polysaccharides in Plants</b>	Kindel, P.
Project 1683	<b>Analysis of LPs from Strains of <i>Pseudomonas syringae</i> pv. <i>morsmorum</i> with Altered Virulence</b>	McGroarty, E.
Project 8065	<b>Soybean Nodule Glutamine: PRPP Amidotransferase: Purification and Properties</b>	Deits, T.

## Botany & Plant Pathology

Project 1125*	<b>Virus and Virus-Like Diseases of Woody, Deciduous Fruit Crops</b>	Ramsdell, D.
Project 1176	<b>Diseases of Woody Plants — Biology and Control</b>	Hart, J.
Project 1206*	<b>Biological Control of Soil-Borne Plant Pathogens in Integrated Crop Management Systems</b>	Safir, G.
Project 1259*	<b>Occurrence of Mycotoxins and the Implications to Animal and Human Health</b>	Hart, L.
Project 1408*	<b>Biological Improvement of Chestnut (<i>Castanea</i> sp.)</b>	Fulbright, D.
Project 1491	<b>Molecular Evolution, Systematics and Population Biology of Pathogenic Fungi</b>	Adams, G.

## Botany & Plant Pathology

(continued)

Project 1499	<b>Environmental and Chemical Determinants of VA Mycorrhizal Root Colonization</b>	Safir, G.
Project 1533	<b>Genetic Engineering of Oilseed Crops</b>	Ohlrogge, J.
Project 1562	<b>Physiology of Resistance and Induced Resistance to Disease in Potato</b>	Hammerschmidt, R.
Project 1648	<b>Mechanisms of Disease Resistance in Plants</b>	Somerville, S.
Project 1655	<b>Molecular Analysis of the Aphid Transmission of Pea Enation Mosaic</b>	de Zoeten, G.
Project 1656	<b>Identification of Plant Virus Host Specificity Determinants</b>	Allison, R.
Project 1657	<b>Diseases of Muck Vegetables, Potatoes and Mint Crops and Their Control</b>	Lacy, M.
Project 1662	<b>Virulence Inhibition Factors and Their Effects on Plant Pathogen Populations</b>	Fulbright, D.
Project 1671	<b>Tissue Culture and Molecular Biology Techniques for the Study of a Plant-Pathogenic Organism</b>	Sears, B.
Project 1673	<b>Biology and Control of the Fungi That Cause Diseases of Field Crops</b>	Hart, L.
Project 1679	<b>Plastome Mutator of <i>Oenothera</i></b>	Sears, B.
Project 3183	<b>Diseases of Tree Fruit Crops and Their Control</b>	Jones, A.
Project 3315	<b>Etiology, Epidemiology and Control of Fungal Diseases of Small Fruit</b>	Ramsdell, D.
Project 3317	<b>Management of Turfgrass Diseases</b>	Vargas, J.
Project 3805	<b>No Carcinogen/Zero Pesticide Residue Production System for Apples</b>	Jones, A.
Project 7547	<b>An Integrated Approach to the Control of Blueberry Virus Diseases</b>	Ramsdell, D.
Project 7548	<b>Asparagus Decline Syndrome and Replant Problem in Michigan</b>	Stephens, C.
Project 7552	<b>Development of Fusarium Yellows Disease Resistance in Celery</b>	Lacy, M.
Project 8059	<b>Center for Genetic and Biochemical Alteration of Plant Lipids and Starch</b>	Ohlrogge, J.
Project 8087	<b>Characterization of Induced Systemic Resistance Signal Molecules</b>	Hammerschmidt, R.
Project 8091	<b>Population Biology of Leucostoma-Causing Canker of Stone Fruit Trees</b>	Adams, G.
Project 8092	<b>Physiological Basis for Tissue Specificity of Plant-Pathogenic MLOs</b>	Klomprens, K.
Project 8093	<b>Identification of Molecular Markers Adjacent to the M1-a Locus in Barley</b>	Somerville, S.
Project 8099	<b>Molecular Genetic Analysis of Plant Virus-Host Interactions</b>	Traynor, P.
Project 7579	<b>Moisture Effects on Wood Fiber Reinforced Cement Composites</b>	Soroushian, P.
Project 8083	<b>Charge Separation and Stabilization in Chloroplast Photosystem II</b>	Babcock, G.

## Center for Remote Sensing

Project 3312	<b>Agricultural and Natural Resource Management: Applications of Advanced Information Processing Technologies</b>	Bartholic, J.
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## Crop & Soil Sciences

Project 319	<b>Classification, Genesis and Evaluation of Michigan Soils</b>	Mokma, D.
Project 569	<b>Breeding and Testing Small Grain Cultivars in Michigan</b>	Freed, R.
Project 908	<b>Fundamental Factors in Cultural and Chemical Weed Control, Weed Competition and Weed Life Cycles</b>	Renner, K.
Project 1103	<b>Adsorption, Transformation and Release of Inorganic Nutrients by Soils</b>	Ellis, B.
Project 1124	<b>Efficient Use of Plant Nutrients</b>	Vitosh, M.
Project 1462*	<b>Soil Productivity and Erosion</b>	Mokma, D.
Project 1471*	<b>Chemistry and Bioavailability of Waste Constituents in Soils</b>	Jacobs, L.



# Crop & Soil Sciences

(continued)

Project 1526	<b>Role of Microorganisms in Plant Nutrition</b>	Paul, E.
Project 1529*	<b>Seed Production of Breeding Lines of Insect-Pollinated Forage Legumes</b>	Leep, R.
Project 1538	<b>Harvest and Storability of Sugarbeet Roots</b>	Theurer, J.
Project 1561*	<b>Forage Protein Characterization and Utilization for Beef Cattle</b>	Hesterman, O.
Project 1568	<b>Plant Biotechnology: Molecular Approaches to Improve Plant Stress Tolerance</b>	Thomashow, M.
Project 1569*	<b>Conservation Tillage Systems</b>	Pierce, F.
Project 1574	<b>Movement and Degradation of Organic Contaminants in Soils and Sediments</b>	Boyd, S.
Project 1587	<b>The Physiology and Biochemistry of Herbicide Action, Selectivity and Degradation</b>	Penner, D.
Project 1595	<b>Impact Absorption, Traction and Wear Tolerance Investigations on Turf and Soil Surfaces</b>	Rogers, J.
Project 1600	<b>Microbial Ecology of Denitrification and Biodegradation</b>	Tiedje, J.
Project 1615	<b>Influence of Mineral-Organic Interactions on Colloid and Pollutant Transport Properties</b>	Anderson, S.
Project 1617*	<b>Biological and Ecological Basis for a Weed Management Model to Reduce Herbicide Use in Corn</b>	Kells, J.
Project 1619*	<b>Environmental and Genotypic Control of Assimilate Allocation in Grain Crops</b>	Smucker, A.
Project 1626	<b>Potato Breeding and Genetics</b>	Douches, D.
Project 1630*	<b>Nutrient Management to Sustain Productivity While Protecting Surface and Groundwater Quality</b>	Ellis, B.
Project 1654	<b>Genetic Improvement of Beans (<i>Phaseolus vulgaris</i> L.) for Yield, Pest Resistance and Food Value</b>	Kelly, J.
Project 1661	<b>Potential for Groundwater Contamination from Pesticides and Nutrients Used on Turf</b>	Branham, B.
Project 1670	<b>Assessment and Simulation of the Water, Nutrient and Agricultural Chemical Dynamics in Field Crop Production</b>	Ritchie, J.
Project 1685	<b>Crop Rotation Effects on Soil Microbial Activity, Nutrient Use Efficiency and Productivity</b>	Harwood, R.
Project 1687	<b>Trace Gas Fluxes in Agricultural Landscapes</b>	Robertson, G.
Project 1692	<b>Evolutionary Ecology of Microbial Populations</b>	Lenski, R.
Project 3122	<b>Development and Correlation of Soil Test Procedures with Crop Yields &amp; Plant Nutrient Contents</b>	Warncke, D.
Project 3128	<b>Systems of Cropping</b>	Christenson, D.
Project 3253	<b>Computer Simulation of Soil Water Infiltration into Michigan Soils</b>	Kunze, R.
Project 3260	<b>Crop Management Studies in Northern Michigan</b>	Leep, R.
Project 3282	<b>Enhancing Profitability and Sustainability of Crop Production Systems for Michigan Farmers</b>	Hesterman, O.
Project 3295	<b>Cultural and Management Factors Affecting Potato Quality</b>	Chase, R.
Project 3296	<b>Weed Management as a Component of Field Crop Production Systems in Michigan</b>	Kells, J.
Project 3300	<b>Design of Experiments</b>	Cress, C.
Project 3301	<b>Soils and Landscapes of Michigan</b>	Crum, J.
Project 3302	<b>Management of Organic Soils for Crop Production</b>	Warncke, D.
Project 3313	<b>Cultivation and Topdressing Effects on Turf and Soil</b>	Rieke, P.
Project 3319	<b>Wheat Breeding and Genetics</b>	Ward, R.
Project 3324	<b>Strategies of Drought Resistance in Beans (<i>Phaseolus vulgaris</i> L.)</b>	Foster, E.
Project 3335	<b>Soil Biophysical Mechanisms of Functional Plant Roots in Crops of Agroecosystems</b>	Smucker, A.
Project 3336	<b>Maize Breeding and Production Management</b>	Harpstead, D.

## Crop & Soil Sciences

(continued)

Project 3802	Development of Production, Marketing and Utilization of Canola as an Alternative Crop in Michigan	Copeland, L.
Project 3808	Development of Systems to Meet Environmental Constraints of Cash Crop Production in the 1990s	Pierce, F.
Project 3810	Evaluating Grasses and Grass-Legume Mixtures for Sustainable and Efficient Forage Production	Moline, W.
Project 3811	User-Friendly Methodology for Managing Animal Manure and Fertilizer Nutrients Within Livestock and Crop Production Enterprises	Jacobs, L.
Project 7545	Improved Production and Utilization Technology for Michigan Potatoes	Douches, D.
Project 7564	Stratification and Fate of N Within Soil Profiles: Management-Induced Changes	Pierce, F.
Project 7566	Assessment and Modeling of Nitrate Leaching Under Conventional and Organically Managed Corn	Paul, E.
Project 7580	Resource Efficient Cropping Systems for Dry Bean and Sugar Beet Production	Christenson, D.
Project 7586	Improved Production and Utilization Technology for Michigan Potatoes	Douches, D.
Project 7591	Management Effects on Colloid-Enhanced Transport of Herbicides and Phosphorus	Anderson, S.
Project 8107	Primisulfuron Sorption, Diffusion and Degradation in Soils — 19F NMR Study	Anderson, S.

## Entomology

Project 401	Apiculture and Crop Pollination	Hoopingartner, R.
Project 1067*	Variables in Agricultural Weather Information Systems	Gage, S.
Project 1187	Biological Control of Selected Insect Pests in Michigan	Stehr, F.
Project 1213	Management of Defoliating Insects and Related Secondary Insects	Scriber, M.
Project 1294*	Black Fly Damage Thresholds, Biology and Control	Merritt, R.
Project 1331*	Interaction of Nematode-Host Variability and Abiotic Factors on Crop Losses	Bird, G.
Project 1563*	Spatial Dynamics of Leafhopper Pests and Their Management on Alfalfa	Whalon, M.
Project 1584*	Design and Evaluation of New Approaches for the Management of Plant-Parasitic Nematodes	Bird, G.
Project 1606	Management of Insect and Mite Pests of Greenhouse, Landscape and Turfgrass	Smitley, D.
Project 1611	Insect Management: An Ecosystem Analysis Approach for Preventive Pest Management	Haynes, D.
Project 1613	Factors Regulating Insect Host-Plant Colonization	Miller, J.
Project 1640*	Integrated Crop Management Effects on Stalk-Boring <i>Lepidoptera</i>	Scriber, M.
Project 1644	Plant Chemical Defenses, Insect Counter-Adaptations and Factors Affecting Gene Flow in a Hybrid Zone	Scriber, M.
Project 1663	Biology and Management of Insect Pests of Vegetable Crops	Grafius, E.
Project 3269	Using Behavior to Reduce Non-target Impact of Pesticides	Ayers, G.
Project 3294	Michigan State University Insect Museum	Stehr, F.
Project 3299	Management of Field and Forage Crop Insects in Michigan	Landis, D.
Project 3320	Biology and Management of Nematodes Associated With Michigan Agriculture and Natural Resources	Bird, G.
Project 3327	Biology and Control of Biting Flies in Michigan	Merritt, R.
Project 3338	Ecology and Management of Arthropod Vector Populations and Vector-Borne Diseases	Walker, E.
Project 3346	Biology and Management of Tree Fruit Insects	Johnson, J.
Project 7587	Management of Dispersal of Colorado Potato Beetle in Crop Rotational Systems	Grafius, E.

## Entomology

(continued)

Project 8074	<b>Isolation, Identification and Behavioral Effects of Onion Fly Sex Peptide</b>	Miller, J.
Project 8088	<b>Effect of Carbohydrates on Predaceous Activity of the Allegheny Mound Ant</b>	Bristow, C.

## Family & Child Ecology

Project 1523*	<b>At-Home Income Generation: Impact on Management, Productivity and Stability in Rural/Urban Families</b>	Walker, R.
Project 1590*	<b>Housing Transitions of the Maturing Population: Consequences for Rural/Nonmetropolitan Communities in the Western Region</b>	Schiamberg, L.
Project 3801	<b>Economic, Social and Personal Well-Being of Michigan Farm Families in Transition</b>	Walker, R.

## Forestry

Project 978	<b>Financial Evaluation of Forest Management Opportunities</b>	Potter, K.
Project 1048	<b>The Hygroscopic Dimensional Changes of Wood and Wood Products</b>	Suchsland, O.
Project 1148	<b>Development of Techniques in Forest Biometry</b>	Ramm, C.
Project 1198	<b>Biology of Terpenes in Woody Plants</b>	Keathley, D.
Project 1207	<b>Silviculture and Physiology of Michigan Tree Species Grown Under Intensive Management</b>	Dickmann, D.
Project 1432	<b>Public Knowledge and Attitudes Concerning Forest Management Practices</b>	McDonough, M.
Project 1438	<b>Enhancing Amenity Values of Urban and Rural Trees</b>	Kielbaso, J.
Project 1494	<b>Intensive Management for the Regeneration of Conifers and Hardwoods in Michigan</b>	Lantagne, D.
Project 1535	<b>Forest Resources Planning</b>	Leefers, L.
Project 1551	<b>Ecological Factors Affecting Tree Productivity</b>	Pregitzer, K.
Project 3157	<b>Accelerating Tree Growth by Manipulating Genetic and Cultural Factors</b>	Keathley, D.
Project 3331	<b>Soil and Hydrology Relationships of Forested Landscape Ecosystems</b>	Hart, J.
Project 7542	<b>Advanced Technology Applications to Eastern Hardwood Utilization</b>	Huber, H.
Project 7555	<b>Advanced Technology Applications to Eastern Hardwood Utilization</b>	Huber, H.
Project 7565	<b>Advanced Technology Applications to Eastern Hardwood Utilization</b>	Keathley, D.
Project 7571	<b>Advanced Technology Applications of Eastern Hardwood Utilization</b>	Suchsland, O.
Project 7573	<b>Advanced Technology Applications to Eastern Hardwood Utilization</b>	Keathley, D.
Project 7582	<b>Advanced Technology Applications to Eastern Hardwood Utilization</b>	Suchsland, O.
Project 8079	<b>Atmospheric CO<sub>2</sub> and Feedback in the Plant-Soil System</b>	Pregitzer, K.

## Food Science & Human Nutrition

Project 1174*	<b>Food Quality Changes and Energy Consumption Associated with Thermal Processing in Food Service Systems</b>	Zabik, M.
Project 1193	<b>Dietary and Physiological Factors Affecting Bioavailability and Utilization of Nutrients</b>	Chenoweth, W.
Project 1209	<b>Quality of Fresh and Processed Meat Products</b>	Price, J.
Project 1211	<b>Dietary Fat/Carbohydrate Relationships to Selected Health Parameters</b>	Schemmel, R.
Project 1323	<b>Improving Process Efficiency, Product Quality and Nutrient Composition of Fruit and Vegetable Products</b>	Uebersax, M.
Project 1413	<b>Metabolism and Function of Vitamin A</b>	Zile, M.
Project 1419	<b>Processing Treatments Influencing Functional Properties and Utilization of Muscle Foods</b>	Booren, A.



# Food Science & Human Nutrition

(continued)

Project 1444*	<b>Health Maintenance Aspects of Dietary Recommendations Designed to Modify Lipid Metabolism</b>	Romsos, D.
Project 1448	<b>Microbial Food-Borne Diseases</b>	Pestka, J.
Project 1478*	<b>Genetic Improvement of Beans (<i>Phaseolus vulgaris</i>) for Yield, Pest Resistance and Food Value</b>	Uebersax, M.
Project 1506*	<b>Development of New Processes and Technologies for the Processing of Poultry Products</b>	Smith, D.
Project 1511	<b>Regulation of Cell Development in Filamentous Fungi</b>	Linz, J.
Project 1512	<b>Mass Transfer and Separations in Bioprocesses</b>	Grulke, E.
Project 1525	<b>Cleaning of Membrane Separation and General Processing Systems in the Dairy Industry</b>	Partridge, J.
Project 1527	<b>Cook/Chill Food Service Systems: Shelf Life of Precooked Chilled Foods</b>	Sawyer, C.
Project 1532*	<b>Functional Properties of Food Proteins</b>	Smith, D.
Project 1597	<b>Food Toxicology and Safety</b>	Helferich, W.
Project 1599	<b>Regulation of Calcium in Muscle Sarcoplasm</b>	Strasburg, G.
Project 1623	<b>Comparative Aspects of Nutrition and Lipid Metabolism</b>	Romsos, D.
Project 1632	<b>Improving the Quality and Safety of Value-Added Meat and Poultry Products</b>	Smith, D.
Project 1649*	<b>Behavioral and Health Factors That Influence the Food Consumption of Young Adults</b>	Hoerr, S.
Project 1664	<b>Manufacturing and Quality of Reduced-Fat and Reduced-Cholesterol Dairy Foods</b>	Ustunol, Z.
Project 1665	<b>Nutritional Status of Individual and Population —Pantothenic Acid Nutriture and Dietary Assessment</b>	Song, W.
Project 3092	<b>Effect of Raw Material, Processing and Storage Factors on Food Cost and Quality</b>	Wishnetsky, T.
Project 3221	<b>Processing and Quality Evaluation of Fruits and Vegetables</b>	Cash, J.
Project 3276	<b>Food Industry Institute</b>	Haines, W.
Project 3298	<b>Relationship of Diet and Cancer</b>	Bennink, M.
Project 3345	<b>Targeting Michigan Groups at Nutritional/Health Risk</b>	Bond, J.
Project 6866	<b>Cardiac Ca<sup>2+</sup> Channel Defect in Malignant Hyperthermia</b>	Strasburg, G.
Project 8089	<b>Metabolism and Function of Retinoic Acid in Quail Embryogenesis</b>	Zile, M.

# Fisheries & Wildlife

Project 1531	<b>Modeling Avian Population Dynamics: Juvenile Dispersal Patterns and Reproductive Strategies</b>	Winterstein, S.
Project 1540	<b>Ecology, Population Dynamics and Management of Michigan Fishes and Their Food Organisms</b>	Taylor, W.
Project 1552	<b>Wildlife Responses to Forest Management in Michigan</b>	Haufler, J.
Project 1624*	<b>Avian Species in Diverted Farmland</b>	Winterstein, S.
Project 1646	<b>Wildlife Responses to Habitat Management</b>	Campa, H.
Project 3077	<b>Environmental and Genetic Components of Reproduction in Bird Populations</b>	Prince, H.
Project 3248	<b>Improving Productive Public Involvement in Agriculture and Natural Resource Problem Solving</b>	Peyton, R.
Project 3254	<b>Development of Commercial Fish Culture Techniques for Michigan</b>	Garling, D.
Project 3288	<b>Habitat and its Effects on the Ecology and Management of Michigan Fishes</b>	Coon, T.
Project 3292	<b>Food Resource Base for Young-of-the-Year Fish Production in Great Lakes Wetlands</b>	McNabb, C.
Project 3804	<b>Economic Feasibility of Culturing Fish Species that Offer Economic Potential in Michigan</b>	McNabb, C.

## Fisheries & Wildlife

(continued)

Project 7557	Regional Aquaculture Center	McNabb, C.
Project 10001	Regional Aquaculture Center	McNabb, C.
Project 10002	Regional Aquaculture Center	McNabb, C.
Project 10003	Regional Aquaculture Center	McNabb, C.
Project 10004	Regional Aquaculture Center	Batterson, T.

## Human Ecology

Project 3306	Vulnerable Children, Tools for Communities to Monitor Conditions Affecting Youth Development	Keith, J.
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## Human Environment & Design

Project 1442*	Enhancing Health and Safety Through Personal Protective Equipment	Slocum, A.
Project 1565*	Rural Retailing: Impact of Change on Consumer and Community	Sternquist, B.
Project 3286	Residential Architecture in 19th Century Michigan	Graham, R.
Project 3326	Proximity of Clothing to Self: Scale Construction, Measurement and Theory Development	Sontag, M.
Project 3328	China: The Distribution of Food and Agricultural Products	Sternquist, B.

## Horticulture

Project 935	Effects of Biologically Active Chemicals on Plant Growth and Development	Bukovac, M.
Project 1153*	Quality Maintenance and Nutritive Aspects of Vegetables During Processing and Storage	Herner, R.
Project 1155*	Postharvest Physiology of Fruits	Dilley, D.
Project 1222*	Introduction, Multiplication, Evaluation, Preservation, Documentation, Enhancement, Distribution and Utilization of Plant Germplasm	Iezzoni, A.
Project 1272	Physiology of Carbon Balance in Horticulture Crops	Flore, J.
Project 1305*	Rootstock and Interstem Effects on Pome and Stone Fruit Trees	Perry, R.
Project 1325	Sustainable Weed Control and Crop Nutrition on Organic Soil Vegetables	Zandstra, B.
Project 1428	Sour Cherry and Peach Breeding and Genetics	Iezzoni, A.
Project 1461*	Freeze Damage and Protection of Fruit and Nut Crops	Howell, G.
Project 1468	Mineral Nutrition of Vegetable Crops	Widders, I.
Project 1517	Optimization of the Root Zone Environment in Greenhouse Crop Production	Biernbaum, J.
Project 1544	Manipulation and Transfer of Nuclear and Organelle Genes in Vegetable Cultivars by Cell Fusion	Sink, K.
Project 1549	Application of Molecular Genetic Approaches to Vegetable Crop Improvement	Grumet, R.
Project 1589	Environmental and Physiological Variables Effect on Growth, Quality and Marketability of Garden Crops	Carlson, W.
Project 1607	Physiological Adaptation and Cultural Manipulation of Woody Plant Systems	Schutzki, R.
Project 1636	Quality Maintenance of Horticultural Crops During Handling and Storage	Herner, R.
Project 1637	Postharvest Physiology of Fruits	Dilley, D.
Project 1638	Rootstock, Root System and Soil Effects on Fruit Crops Growth and Fruiting	Perry, R.

## Horticulture

(continued)

Project 1680	<b>Biologically Active Natural Products and Value-Added Products from Crops</b>	Nair, M.
Project 1684	<b>Modified Atmosphere Packaging of Horticultural Produce</b>	Cameron, A.
Project 3012	<b>Chemical Regulation of Plant Growth, Quality and Yield</b>	Ries, S.
Project 3218	<b>Manage Viticulture to Maximize Yield/Fruit/Process Quality and Adaptation to Environmental Stress</b>	Howell, G.
Project 3227	<b>Adaptation of Cultivars and Cultural Practices to Michigan Conditions</b>	Kesner, C.
Project 3247	<b>Breeding and Selection of New Grape Cultivars for Michigan</b>	Hancock, J.
Project 3266	<b>Breeding and Genetics of Onions</b>	Ewart, L.
Project 3272	<b>Physiological and Environmental Factors Influencing Growth and Development of Flower Crops</b>	Heins, R.
Project 3281	<b>Efficient Use of Fertilizer in Fruit Production</b>	Hanson, E.
Project 3305	<b>Viticultural Practices for Mechanical Pruning and Crop Control of Concord and Niagara Grapevines</b>	Zabadal, T.
Project 3308	<b>Physiological and Genetic Factors Influencing the Content and Bioavailability of Nutrients in Vegetable Crops</b>	Kelly, J.
Project 3309	<b>Controlling Flowering, Fruit Set and Fruit Size in Tree Fruits</b>	Dennis, F.
Project 3310	<b>Preserving Postharvest Quality of Fruits and Vegetables</b>	Beaudry, R.
Project 3311	<b>Development of Tree Fruit Cultural Practices to Improve Fruit Quality and Productivity</b>	Hull, J.
Project 3323	<b>Genetic Improvement of Strawberries and Blueberries</b>	Hancock, J.
Project 7544	<b>Apple Quality Improvement Through Production, Storage and Distribution Technology</b>	Dilley, D.
Project 7546	<b>Factors Causing the Decline of Stone Fruit Trees with Emphasis on Sweet Cherry Under Michigan Conditions</b>	Flore, J.
Project 7583	<b>Factors Causing Decline of Stone Fruit Trees with Emphasis on Sweet Cherry Under Michigan Conditions</b>	Flore, J.
Project 7585	<b>Apple Quality Improvement Through Production, Storage and Distribution Technology</b>	Dilley, D.
Project 8097	<b>Inhibition of Flowering in Apple: Role of Gibberellin Metabolism</b>	Dennis, F.
Project 8109	<b>Developing Genetic Markers for Breeding and Biotechnology of Asparagus</b>	Sink, K.

## Kellogg Biological Station

Project 8101	<b>Spatial Patterning of N Transformations in Agricultural Ecosystems</b>	Paustian, K.
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## Large Animal Clinical Sciences

Project 1417*	<b>Bovine Respiratory Disease: Risk Factors, Pathogens, Diagnosis and Management</b>	Baker, J.
Project 1550	<b>Bovine Respiratory Disease: Risk Factors, Immunology, Pathogenesis and Control</b>	Baker, J.
Project 1631	<b>Assessment of Selenium, Vitamin A, Vitamin E and Other Metabolites in Animals for Diagnostic Purposes</b>	Stowe, H.
Project 1674	<b>Airway Disease in the Horse</b>	Robinson, N.
Project 6805	<b>Bovine Leukemia in Michigan Dairy Cattle</b>	Kaneene, J.
Project 6848	<b>Immunogenicity Studies Using Purified Outer Membranes of <i>Haemophilus pleuropneumoniae</i></b>	Thacker, B.



## Large Animal Clinical Sciences

(continued)

## Mechanical Engineering

## Microbiology & Public Health

## MSU-DOE Plant Research Lab

Project 6855	<b>Infectious Causes of Diarrhea Among Neonatal Farm Animals</b>	Holland, R.
Project 6856	<b>The Influence of Choline Deficiency on the Development of Ketosis and Fatty Liver in Dairy Cows</b>	Herdt, T.
Project 6857	<b>Epidemiological Study of Food Safety Concerns of <i>E. coli</i> 0157:h7</b>	Kaneene, J.
Project 6862	<b>The Effect of Use of a Platelet-Activating Factor Antagonist (WEB 2086) in Equine Large Colon Torsion</b>	Wilson, D.
Project 6865	<b>Transvaginal/Transuterine Aspiration of Chorioallantoic Fluid from Early Bovine Pregnancies</b>	Sprecher, D.
Project 6869	<b>Evaluation of Dairy Reproductive Health Indicators</b>	Lloyd, J.
Project 7561	<b>Information Management, Systems Modeling and Computer Simulation for Health Management in Hogs</b>	Lloyd, J.
Project 7581	<b>NC Region IR-4 Program to Clear Animal Drugs for Minor Use</b>	Holland, R.

Project 8084	<b>Wind-Aided Flame Spread Over Wood</b>	Wichman, I.
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Project 1314	<b>Symbiotic Infection of Legume Roots by Nitrogen-Fixing Rhizobium</b>	Dazzo, F.
Project 1371	<b>An In-Vivo Model to Study Latent Pseudorabies Virus Infections</b>	Maes, R.
Project 1453	<b>Structure/Function Relationships in Chicken Globin and Histone Genes</b>	Dodgson, J.
Project 1481	<b>Characterization and Inhibition of Bacterial Urease</b>	Hausinger, R.
Project 1557	<b>Molecular Regulation of Streptomyces Antibiotic Synthesis</b>	Champness, W.
Project 1593*	<b>Advanced Technologies for the Genetic Improvement of Poultry</b>	Dodgson, J.
Project 1628	<b>Identification and Analysis of the Genes of Marek's Disease Herpesvirus and the Proteins They Encode</b>	Velicer, L.
Project 1629	<b>Lignin Degradation by Wood-Rotting Fungi</b>	Reddy, C.
Project 1681	<b>Molecular Basis of Symbiotic Plant-Microbe Interactions</b>	de Bruijn, F.
Project 1689	<b>Degradation of Lignocellulose by Termites and Their Microbial Symbionts</b>	Breznak, J.
Project 3116	<b>Bacterial Ecology: Diverse Energy Reactions and Regulation in Bacteria</b>	Uffen, R.
Project 3120	<b>Microbial Decomposition of Organic Matter in Aquatic Systems</b>	Klug, M.
Project 6858	<b>PCR-Based Evaluation of the Influence of Vaccination on Pseudorabies Virus Latency</b>	Maes, R.
Project 6861	<b>Nucleotide Sequence Analysis of cDNA Encoding the Matrix-Like Protein That May Elicit CMI Against BRSV</b>	Velicer, L.
Project 7559	<b>Polymerase Chain Reaction Based Detection of Pseudorabies Virus Latency</b>	Maes, R.
Project 8078	<b>Marek's Disease Herpesvirus: Membrane Glycoprotein Gene Analysis, a gD Homolog</b>	Velicer, L.
Project 8096	<b>Characterization and Inhibition of Bacterial Urease</b>	Hausinger, R.
Project 8103	<b>Antisense RNA Genes to Inhibit the Replication of Avian Leukosis Virus</b>	Salter, D.

Project 8077	<b>Control of mRNA Stability in Dicotyledonous Plants</b>	Green, P.
Project 8080	<b>A Gene Controlling the Reaction of <i>Arabidopsis</i> to the Black Rot Disease</b>	Somerville, S.
Project 8081	<b>Molecular Basis and Manipulation of Stress-Induced Betaine Synthesis in Plants</b>	Hanson, A.

# MSU-DOE Plant Research Lab

(continued)

Project 8082	CIS and Trans-Acting Elements/Factors in Nodulin Gene Regulation	de Bruijn, F.
Project 8090	Role of Cell Wall-Degrading Enzymes in Plant Pathogenesis	Walton, J.
Project 8095	Photoperiodic Control of Gibberellin Metabolism in Long-Day Plants	Zeevaart, J.
Project 8098	Genetic Alteration of Respiratory Capacity in Crop Plants	McIntosh, L.
Project 8100	Genetic Analysis of Plant Cell Wall Structure and Function	Somerville, C.
Project 8106	Analyses of the Antifungal and Insecticidal Activities of Chitin-Binding Lectins In-Vitro and in Transgenic Plants	Raikhel, N.

## Packaging

Project 1520	Diffusion and Sorption Properties of Plastics as Related to the Quality of Packaged Products	Giacin, J.
Project 1672	Consumer Size Modified Atmosphere Packaging of Fresh Produce	Lee, J.
Project 3321	Improving the Quality of Products and Distribution Productivity Through Packaging Innovation	Twede, D.
Project 3322	Mass Interactions in Solid Polymer/Fluid Phase Systems and Their Relation to Product Quality	Hernandez, R.

## Park & Recreation Resources

Project 1667	Factors Affecting Timber Management on Michigan Hunting Clubs and Leased Lands	Nelson, C.
Project 1677	Predicting Recreation and Tourism Choices	Stynes, D.
Project 1678	Impacts of Recreation and Tourism	Stynes, D.
Project 3280	Travel, Tourism and Recreation Resource Center	Holecek, D.
Project 3343	Psychology of Recreation and Tourism	Fridgen, J.

## Pathology

Project 1154*	Prevention and Control of Enteric Diseases of Swine	Grimes, S.
Project 1307	Pathologic Effects of Chemicals of Importance to Michigan Agriculture	Sleight, S.
Project 1634	Hematopathology of Line-Bred Livestock	Bell, T.
Project 1647	Ocular and Otic Pathology of Animals	Render, J.
Project 1651	Genetic Disorders of Livestock	Padgett, G.
Project 1658	Prevention and Control of Enteric Diseases of Domestic Animals	Grimes, S.
Project 6853	Heteromyeloma Against the 987P Pilus of Enterotoxigenic <i>Escherichia coli</i> A Porcine/Murine	Grimes, S.
Project 6863	B-Mannosidosis Carrier Detection in Salers Cattle Using RFLP Analysis	Patterson, J.
Project 6867	Molecular Aspects of Latency in Herpesvirus of Turkeys	Mackenzie, C.

## Pesticide Research Center

Project 1414	Effects of Toxic Chemicals on Aquatic Systems	Giesy, J.
Project 1571*	A National Agricultural Program to Clear Pest Control Agents and Animal Drugs for Minor Uses	Hollingworth, R.
Project 3330	Environmental Dynamics of Xenobiotics in the Environment and Analytical Methods Development	Zabik, M.
Project 7541	NC Regional IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
Project 7575	Assessment of Episodic Atmospheric Events That Regulate Movement of Economically Important Migratory Pests	Whalon, M.
Project 7577	IR-4 Animal Drug Program — Headquarters	Hollingworth, R.

Project 7578	<b>NC Region IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses</b>	Hollingworth, R.
Project 7584	<b>Michigan NAPIAP Project, 1992</b>	Olsen, L.
Project 8052	<b>NC Region IR-4 Leader Lab Program to Clear Animal Drugs for Minor Uses</b>	Hollingworth, R.

## Pesticide Research Center

(continued)

Project 1542	<b>Neurohumoral Control of Growth and Development of the Exocrine Pancreas In-Vitro</b>	Hootman, S.
Project 1554	<b>Carbohydrate Recognition During the Development of the Nervous System</b>	Zipser, B.

## Physiology

Project 1075	<b>Natural Resources in Economic Development: Spatial Analyses</b>	Chappelle, D.
Project 1102	<b>Public Policy Regarding Health and Environmental Risks: Assessment, Management and Public Participation</b>	Bronstein, D.
Project 1515*	<b>Policy Implications for Farm Household and Rural Community Responses to Economic Changes</b>	Vlasin, R.
Project 1536	<b>Systems Approaches to Resource Assessment, Planning and Management for Rural Development</b>	Schultink, G.
Project 1545	<b>Identification, Assembly and Application of Developmental Data with Michigan Community Decision Makers</b>	Kimball, W.
Project 3235	<b>Mineral Lands Development, Energy Requirements and Environmental Impacts</b>	Kakela, P.
Project 3267	<b>Design and Management Alternatives for Sustainable Agriculture and Natural Resource Systems</b>	Edens, T.
Project 3297	<b>A Strategic Environmental Management System for Michigan's Inland Water Resources</b>	Bartholic, J.
Project 3318	<b>Water Resource Protection at the Interface of the Hydrologic Cycle and Cultural Influences</b>	Dersch, E.
Project 3332	<b>Michigan Farming Systems</b>	Axinn, G.
Project 3803	<b>Cooperative Action Among Michigan Communities to Achieve Economic Advancement</b>	Vlasin, R.

## Resource Development

Project 1612	<b>Strategic Analysis of Technical Change in Commodity Subsectors</b>	Busch, L.
Project 1620*	<b>The Transformation of Agriculture: Resources, Technologies and Policies</b>	Harris, C.
Project 1641*	<b>The Changing Structure of Local Labor Markets in Non-metropolitan Areas</b>	Bokemeier, J.
Project 1642*	<b>Organization and Structural Changes in the Dairy Industry</b>	Schwarzweiler, H.
Project 3337	<b>Work and Family Issues in Rural Michigan Labor Markets</b>	Bokemeier, J.
Project 3339	<b>Migration, Work Careers and Rural Development in Michigan's Upper Peninsula</b>	Schwarzweiler, H.

## Sociology



# List of MAES Contributors

July 1, 1991  
to June 30, 1992



Abbott Laboratories	Bristol-Myers
Academy for Educational Development	Burnaby Lake Greenhouses
Agency for International Development	Butterworth Hospital
Agricultural Chemical Group	Byrne, Donald A.
Agrolinz, Inc.	Campbell Soup Company
Agrosoke, Inc.	Canadian Embassy
Agtrol Chemical Products	Cargill Hybrid Seeds
Allelix Crop Technologies	Cedar Chemical Corp.
Allen & Baer Associates	Central Maryland Bee Keepers Association
Allen Foundation	Central Produce Sales
Alpers Farms	Central Soya
Aluminum Company of America	Centro International de Mejoramiento
American Cancer Society	Chelsea Milling Company
American Colloid Company	Cherry Marketing Institute, Inc.
American Cyanamid Company	Chevron Oil Field Research Company
American Dairy Association of Michigan	Ciba-Geigy Corp.
American Energy and Environmental Engineering	CIESIN
American Fishing Tackle Manufacturing Association	CIMMYT
American Floral Endowment	Clackamas Greenhouses
American Florists Endowment	The Clorox Technical Center
American Heart Association of Michigan	Coalition Technologies, Ltd.
The Andersons	Colorado State University
Anheuser-Busch Company, Inc.	Comstock Michigan Fruit
Aquatrols Corp. of America	Consumers Power Company
Asgrow Seed Company	Council for Solid Waste Solutions
Association of American Railroads	County of Huron
Atochem North America, Inc.	Crystal Enterprises, Inc.
BARD	Crystal Mountain Resort
BASF Corp.	C.S.I. Chemical Corp.
Bedding Plant Foundation	Dadant & Sons, Inc.
BEL, Inc.	Development Alternatives, Inc.
Bil-Mar Foods, Inc.	Dow Chemical USA
BIOSIS	Dow Corning Corp.
Bio-Techmarketing, Inc.	DowElanco
BIT Manufacturing, Inc.	DowElanco Specialty Products
Blackmore Company, Inc.	Drackett Company
Bolider Intertrade, Inc.	DuPont
E.J. Brach Corp.	DuPont Agricultural Products
Brady Farms, Inc.	Easter Lily Research Foundation
	Eastman Kodak Company

Paul Ecke Poinsettias  
 Ecogen, Inc.  
 E. & I. Ziegelman Foundation  
 Eli Lilly & Company  
 Emerald Isle, Ltd.  
 Environmental Protection Agency  
 Evenflo Products  
 Fairfield American Corp.  
 Farmline International, Ltd.  
 Fase, Mr. & Mrs. Darrell  
 Federal Express  
 Fernlea Flowers, Ltd.  
 FMC Corp.  
 Food and Drug Administration  
 Foundation for Agronomic Research, Inc.  
 Four Star Greenhouse  
 General Electric Company  
 General Foods USA  
 General Mills  
 Gerber Companies Foundation  
 Gerber Foods  
 Gerber Products Company  
 Gettel Farms, Inc.  
 GIFAP ASBL  
 Glass Corner Greenhouses, Inc.  
 The Fred C. Gloeckner Foundation  
 Goldschmidt Chemical Corp.  
 Gowan Company  
 Grace Sierra Crop Protection Company  
 Great Lakes Concentrates Company  
 Great Lakes Hybrids, Inc.  
 Great Lakes Protection Fund  
 Green Bay Food Company  
 Griffin Corp.  
 Growmark, Inc.  
 Gubert, Karl P.  
 Gull Lake View Golf Club  
 Gustafson, Inc.  
 Harris Moran Seed Company  
 Health Science Research Foundation  
 Heinz USA  
 Hengemuehle, Sue  
 Herbruck's  
 Hershey Foods Company  
 Joseph H. Hill Memorial Foundation  
 Hoechst-Roussel Agri-Vet Company  
 Hoffmann-La Roche, Inc.  
 Hogg, John A.  
 HybriTech

ICI Agricultural Products  
 ICI Americas, Inc.  
 Illinois Institute of Technology, Research Institute  
 Inland Container Corp.  
 International Development Resource Center  
 International Group of National Associations of Manufacturers of Agrochemical Products  
 International Society for Horticulture Science  
 ISK-Biotech Corp.  
 Israelite House of David  
 Jamaica Agricultural Development Foundation  
 Johnson, Kathryn  
 Johnson Wax & Son, Inc.  
 Kalamazoo Valley Plant Growers Co-op., Inc.  
 KALSEC, Inc.  
 Kellogg Company  
 W.K. Kellogg Foundation  
 King Agro, Inc.  
 King Milling Company  
 Kirin Brewery Company, Ltd.  
 KLM Bio Systems, Inc.  
 Knappen Milling Company  
 Land Improvement Contractors of America  
 Lansing Grain Company  
 Lansmont Corp.  
 Legislative Service Bureau  
 LESCO, Inc.  
 Lewis, Charlotte F.  
 Eli Lilly & Company  
 Long, Robert J.  
 Loveland Industries, Inc.  
 Ludington Charter Boat Association  
 MBG Marketing  
 John D. & Catherine T. MacArthur Foundation  
 Marietta Martin Chemicals  
 Andy Mast Greenhouses  
 Henry Mast Greenhouses  
 Neal Mast & Sons Greenhouses  
 McDonough, Maureen H.  
 J. G. Meier & Sons Company  
 Meister Publishing Company  
 Mennel Milling Company of Michigan  
 Merck & Company, Inc.  
 MERRA  
 Merrell Dow Pharmaceuticals

Metro West Chapter–Michigan Steelhead & Salmon Association

Micandy Garden Greenhouses, Inc.

Michigan Agricultural Commodities, Inc.

Michigan Apple Research Committee

Michigan Asparagus Advisory Board

Michigan Asparagus Research Committee

Michigan Audubon Society

Michigan B.A.S.S., Chapter Red., Inc.

Michigan Beekeepers Association

Michigan Biotechnology Institute

Michigan Blueberry Growers Association

Michigan Carrot Committee

Michigan Cherry Committee

Michigan Crop Improvement Association

Michigan Department of Agriculture, Grape & Wine Council

Michigan Department of Education

Michigan Department of Natural Resources, Forest Management Division and Wildlife Division

Michigan Department of Public Health

Michigan Department of Transportation

Michigan Energy & Resource Research Association

Michigan Forestry & Park Association

Michigan Foundation Seed

Michigan Great Lakes Protection Fund

Michigan Mint Research & Development Program

Michigan Nursery & Landscape Association

Michigan Onion Committee

Michigan Pear Research Association

Michigan Plum Advisory Board

Michigan Potato Industry Commission

Michigan Soybean Promotion Committee

Michigan State Horticulture Society

Michigan Sugar Company

Michigan Turfgrass Foundation

Michigan Vegetable Council

Mid-American Growers

Miles, Inc., Agriculture Division

Milwaukee County

Mink Farmers Research Foundation

Mississippi Valley State University

M&M Mars

Mobay Corp.

Moeller, Thomas & Beth

Molbak's Greenhouse, Inc.

Monitor Sugar Company

Monsanto Agricultural Products Company

Montecucco, Paul & Frances

Moorman Manufacturing Company

Kay Mukai Research Foundation

Murco, Inc.

Muscular Dystrophy Association, Inc.

Mycogen Corp.

Myers, Ted R. & Ina M.

National Academy of Sciences

National Council of the Paper Industry for Air & Stream Improvement

National Dairy Council

National Dairy Promotion & Research Board

National FFA Organization

National Grape Cooperative Association

National Institutes of Health

National Kidney Foundation of Michigan

National Particleboard Association

National Pork Producers Council

National Science Foundation

National Turfgrass Evaluation Program

Nefab, Inc.

Neogen Corp.

New Golf Concepts, Inc.

Nor-Am Agricultural Products, Inc.

Nor-Am Chemical Company

North American Strawberry Growers Association

Novo Nordisk

Ohio Floriculture Foundation

Ohio State University Research Foundation

Owens Illinois

Parrish & Heimbecker

Patton, Robert A.

Penford Products Company

Pheasants Forever, Inc.

Pickle Packers International, Inc.

Pillsbury Company

Pioneer Hi-Bred International, Inc.

Plantco, Inc.

Plato Industries, Inc.

Post Gardens of Battle Creek, Inc.

Potash & Phosphate Institute of Canada

Precision Laboratories, Inc.

Premier Peat Moss, Ltd.

Professional Plant Growers Association

Program Resources, Inc., Frederick Operation

Pugh, Homer R.

Purdue University

Purina Mills, Inc.

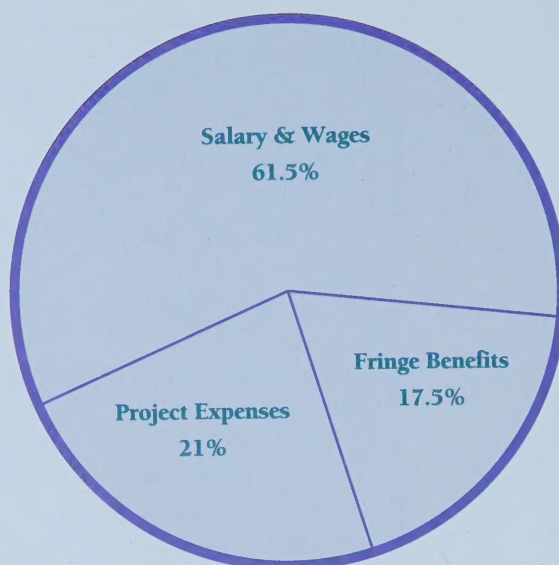


Quaker Oats Company  
 Ralston-Purina Company  
 Resource Seeds, Inc.  
 Rhizo Tech, Inc.  
 Rhone-Poulenc Agricultural Company  
 Rhone-Poulenc, Field Research Division  
 Rhone-Poulenc Nutrition Animale  
 Ringer Corp.  
 RMT, Inc.  
 Rockefeller Foundation  
 Rogers Brothers Seed Company  
 Rogers NK Seed Company  
 Rohm & Haas Company  
 Roses, Inc.  
 Royal Sluis, Inc.  
 Rutgers University  
 Saginaw County  
 Saginaw County Mosquito Abatement  
 Committee  
 Saginaw Valley Beekeepers Association  
 San Diego State University Foundation  
 Sandoz Agro, Inc.  
 Schmidt Bros., Inc.  
 Schroeder, Aubrey L.  
 O.M. Scott & Sons Company  
 Select Sires, Inc.  
 Snack Food Association  
 Sod Growers Association of Michigan  
 South Eastern Poultry & Egg Association  
 Southeastern Michigan Beekeepers  
 Association  
 Sport Fishing Institute Fund  
 Star of the West Milling Company  
 Sulzer Brothers, Inc.  
 Sun Refining & Marketing Company  
 Sustane Corp.  
 Svalof Seed, Ltd.  
 Tanton, John  
 Tektronix  
 Tennessee Valley Authority  
 Terra International, Inc.  
 Texas Agricultural Extension Service  
 Texas A&M  
 The Toro Company  
 Traverse Fruit Wood Company  
 Tredegar  
 Uniroyal Chemical Company  
 Uniroyal, Inc.  
 United Agri Products

United Blueberry Producers of Michigan  
 United Parcel Service  
 U.S. Agency for International Development  
 U.S. Air Force  
 U.S. Department of Agriculture  
 U.S.D.A. APHIS  
 U.S.D.A. Agricultural Research Service  
 U.S.D.A. CSRS  
 U.S.D.A. Economic Research Service  
 U.S.D.A. Forest Service  
 U.S.D.A. North Central Forest Experiment  
 Station  
 U.S.D.A. Research Cooperative Agreement  
 U.S.D.A. Science & Education  
 U.S.D.A. Soil Conservation Service  
 U.S. Department of Energy  
 U.S. Department of Interior  
 U.S. Environmental Protection Agency  
 U.S. Geological Survey  
 U.S. Golf Association  
 University of California  
 University of Hawaii  
 University of Idaho  
 University of Illinois  
 University of Michigan  
 University of Minnesota, Forest Resources  
 University of Nebraska  
 University of Toronto/IEA  
 University of Virginia  
 University of Wisconsin  
 U.P. White Tails Associates, Inc.  
 The Upjohn Company  
 Valent USA Corp.  
 Various Donors  
 Vigoro Industries, Inc.  
 Vlasic Foods, Inc.  
 Western Michigan Bedding Plant  
 Association  
 Whitaker Foundation  
 Wildlife Limited, Inc.  
 Wilkie Company, Turf Equipment Division  
 Wilson, Dr. Charles J.  
 Winrock International  
 Yoder Brothers, Inc.  
 Youngs  
 Zelenka Nursery, Inc.  
 Erwin and Isabelle Ziegelman Foundation  
 Zoological Society of Milwaukee County

# Financial Report

July 1, 1991  
to June 30, 1992



**Distribution Of  
Appropriated  
Funds**

## INCOME:

Federal Appropriations	\$4,788,059
Hatch	\$3,700,384
McIntire-Stennis	\$165,941
Hatch RRF	\$835,949
Hatch Animal Disease Research	\$85,785
State Appropriations	\$23,480,580
<b>TOTAL APPROPRIATIONS:</b>	<b>\$28,268,639</b>
Grants — Federal, State and Private	\$24,285,842

**\$52,554,481**

## EXPENSES:

Salaries	\$17,377,643
Fringe Benefits	\$4,963,584
Project Expenses	\$5,927,412
Grants — Federal, State and Private	\$24,285,842

**\$52,554,481**

## Personnel

(Full-time Equivalents)

Research Staff*	160.19
Professors	83.98
Associate Professors	23.93
Assistant Professors	20.31
Research Associates and Specialists	31.97
Support Staff	162.24
Administrative Professionals	75.79
Supervisors	21.56
Clerical	56.04
Technicians	8.85

\*Does not include department chairpersons/unit administrators





Michigan Agricultural Experiment Station  
Robert G. Gast, Director  
Michigan State University  
East Lansing, Michigan 48824 - 1039

**SR-64, January 1993**

*The Michigan State University Agricultural Experiment Station is an equal opportunity employer and complies with  
Title VI of the Civil Rights Act of 1964 and Title XI of the Education Amendments of 1972.*

**MICHIGAN STATE**  
UNIVERSITY